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REMARKS ON ORTHOSTATIC ALBUMINURIA.

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BY "orthostatic albuminuria" I mean a condition characterised by the occasional, but not invariable, presence of albumin (sometimes little, sometimes much) in the urine passed when the patient is up, that is to say, has been up for some time, but not in that passed when he is in bed or immediately after he has been lying for some time in the recumbent posture—for instance, in that passed immediately after the night's rest, on getting out of bed in the morning.* The amount of albumin in the urine varies a good deal in different cases, and in the same case it varies according to the time of day, even when the patient remains up the whole day. In some cases the urine passed late in the evening, not long before going to bed, is quite free from albumin. The albuminous urine, in addition to ordinary urinary albumin (serum-albumin) sometimes contains likewise a little of the protein, formerly thought to be nucleo-albumin, precipitated by acetic acid in the cold. Thus, in the case of a young man, aged 18 years, recently under my observa-

* Much of the substance of the present paper was included in the remarks I made, at the Medical Section of the Royal Society of Medicine, May the 2nd, 1911, during the discussion on the "After-history of Cases of Albuminuria occurring in Adolescents."

tion, the urine passed immediately on getting out of bed in the morning was free from protein of any kind, whereas that passed at ten o'clock in the morning contained both ordinary urinary albumin and a protein precipitated by the addition of very dilute acetic acid in the cold. The urine passed at about ten or eleven o'clock in the morning is often that which contains the greatest amount of albumin, and it is an unfortunate mistake for the doctor to ask a patient to send a specimen of his "morning urine" to be tested, for in that way, in cases of orthostatic albuminuria, the patient, wishing to comply with the doctor's request, may either send a sample of urine passed immediately after getting out of bed in the morning, which would be free from albumin, or a sample of the urine passed at ten or eleven o'clock, precisely that most likely to contain the greatest amount of albumin.

Though in cases of orthostatic albuminuria the time of day sometimes makes a considerable difference in the amount of albumin in the urine, even when the patient remains up and about during the whole of the day, it has been experimentally proved (in some cases, at all events) that the posture, not the time of day or the time of meals, is the chief determining cause in the production of the albuminuria in question. (There must, of course, be some other cause, but to this I shall refer later.) For instance, if a patient with orthostatic albuminuria remains lying in the recumbent position in bed throughout the day, no albumin appears in his urine, and thus it is that in hospital in-patients the presence of orthostatic albuminuria is frequently overlooked, the specimens of urine for examination being generally passed whilst the patient is, or has just been, lying in bed.

In orthostatic albuminuria the albuminous urine often contains calcium oxalate crystals, and occasionally a few red blood-corpuscles are found. The presence of these red cells may turn out to be a (temporary) genuine feature of orthostatic albuminuria, but it may on the other hand be merely connected with concomitant oxaluria. Usually tube-casts are absent, but, by the help of the centrifugal machine, a few hyaline casts and even one or two granular or cellular casts may be detected. Perhaps, however, in these cases it would be more accurate to speak of "hyaline casts containing cells or granules" than to call them typical "cellular" and "granular" casts. The administration as a "test" of calcium lactate (suggested by Sir A. E. Wright) seldom suffices, even for a few days, to remove the albumin from the urine of patients with typical orthostatic albuminuria.

This type of albuminuria occurs of course in girls as well as in boys, and possibly routine examination of the urine of children will show that its average commencement is at a slightly earlier age in girls than in boys.

I believe that amongst cases of albuminuria in apparently healthy children and young adults orthostatic albuminuria is by far the most frequent type, and I do not think that albuminuria in these apparently healthy subjects should ever be regarded as belonging to any other than the orthostatic class unless it can be definitely ascertained that specimens of the urine passed immediately on getting out of bed after the night's rest contain albumin.

My personal knowledge of cases of orthostatic albuminuria is derived from what I have observed in the young men whom I have examined as medical officer to a large insurance company, in candidates for clerkships at a London bank, and in a certain number of cases in hospital or private practice. Several young men with orthostatic albuminuria whom I have examined have been accepted for life assurance or for clerkships, and I have never heard of any bad result in such cases, nor have I heard from other doctors, or from a study of the extensive literature of the subject, of any single bad result in a case of typical orthostatic albuminuria. This is very significant if one considers the great number of cases which have been reported on.

A case which I have frequently examined and know better than others is that of a man, now aged 28 years, in whom orthostatic albuminuria has been present at least since 1907, but probably from a much earlier date. He is fond of hunting and open-air exercise of a very active kind. Sometimes his urine has contained a few hyaline casts, and sometimes there have been granules or cells in the hyaline casts. This young man feels well, and may even gain in weight when he can live the active, open-air life which he loves. He is of the tall and thin type rather characteristic of orthostatic albuminuria, and, as usual in such cases, he grew rapidly in height during early adolescence, and is rather abnormally subject to coldness and redness of the hands (the so-called "bad circulation in the extremities"). Orthostatic albuminuria was still present when I recently examined his urine. A fellow-student of mine became aware of the presence of albumin in his urine about twenty-seven years ago when working in a physiological laboratory, and many years afterwards I heard from him that the albuminuria (which was doubtless of the orthostatic type) had disappeared. Another medical man whom I know has told me that about seventeen

years ago when he was nineteen years old, and was working in a physiological laboratory in Germany, he detected albumin in his urine. The urine passed immediately after getting out of bed in the morning was free from protein of any kind, but at about ten o'clock in the morning it contained a good deal of protein, partly the kind precipitated by the addition of dilute acetic acid in the cold and partly ordinary urinary albumin (serum-albumin). Late in the evening, before he went to bed, it became quite free from protein again. His case was therefore pronounced by the professor of medicine at the German University where he was studying to be an example of "cyclic albuminuria." The albuminuria in his case continued certainly till the age of twenty-two years; it is not known at what age it finally disappeared, but his urine is now free from protein. The term "cyclic albuminuria" was first introduced for the kind of albuminuria now under discussion by Pavy* in 1885, but Moxon,† several years previously, had already recognised an "intermittent albuminuria of adolescents" (and had alluded to a "remittent albuminuria"), in which the albuminuria was specially marked after breakfast, though generally absent on rising from bed in the morning. Much time naturally elapsed before any really definite knowledge could be acquired regarding the significance (from the prognostic point of view) either of typical orthostatic albuminuria or of other forms of temporary albuminuria, such as that induced by violent muscular exercises (running and rowing in races, etc.). Now at last one is justified in asserting that the prognosis of orthostatic albuminuria is so good that no candidate for an appointment or for life assurance should be rejected merely on account of its presence, that is to say, in the absence of other points against him. Of course, however, orthostatic albuminuria may be connected with various morbid conditions, some of which are of great importance. It is not surprising that, occurring as it not rarely does in "overgrown" children and in tall, flat-chested adolescents, it should be occasionally associated with early pulmonary tuberculosis. I have observed orthostatic albuminuria in two young men with grave forms of congenital heart disease.‡ There is, moreover, no reason to suppose that true orthostatic albuminuria may not sometimes accompany albuminuria due to actual nephritis,

* F. W. Pavy, "On Cyclic Albuminuria," 'Brit. Med. Journ.,' 1885, ii, p. 789.

† W. Moxon, 'Guy's Hospital Reports,' London, 1878, xxiii, p. 236.

‡ F. P. Weber, "Congenital Heart Disease, with Extreme Secondary Polycythæmia and Orthostatic Albuminuria," 'Edinburgh Med. Journ.,' 1909, New Series, ii, p. 18; F. P. Weber and G. Dorner, "Congenital Pulmonary Stenosis," 'Proc. Roy. Soc. Med.' (Clinical Section), London, 1911, iv, p. 85.

but it is highly probable that, when its presence has been first discovered on examining the urine during or after scarlet fever, it has occasionally been incorrectly accepted as evidence of scarlatinal nephritis. Naturally, very few kidneys of patients known to have had orthostatic albuminuria have been microscopically examined. In one such case, however, slight renal "changes" were discovered, but in the light of recent examinations it appears that slight so-called "changes" in the renal cortex may be found by microscopical examination in children who have never had any signs of kidney disease. At any rate, orthostatic albuminuria cannot be reasonably attributed to the presence of such slight microscopical "changes."

For practical purposes I think that what is called "lordotic albuminuria" should be regarded as a variety of orthostatic albuminuria, in which a decidedly lordotic position acts as an essential and determining (though not the only essential) cause of the albuminuria; such a position of the body has, in fact, been experimentally proved to be a determining cause in some of the cases. On this subject much has recently been written in Germany and other parts of the Continent. In cases of lordotic albuminuria, even when the patient is kept lying in bed, the urine can occasionally be made to temporarily contain albumin by placing a bolster under the small of the patient's back, so as to produce an artificial lordosis. Thus, in a somewhat asthmatic girl, aged 12 years, who was under my observation with orthostatic albuminuria, the urine was free from albumin when she was kept lying in bed, except when a bolster was placed under the small of her back so as to produce an artificial lordosis. This was tried for about an hour on two occasions, and as a result on each occasion albumin appeared in the urine.* Of course, however, in cases of lordotic albuminuria, the lordotic position cannot be regarded as the only cause of the albuminuria, for artificial lordosis will not produce albuminuria in all children. Similarly, in other cases of orthostatic albuminuria, the upright position of the body cannot be regarded as the only cause of the appearance of albumin in the urine, for if it were so, one would expect to find albuminuria in all children and young adults, excepting when they were, or had just been, lying down. There must be some other cause, such as a functional defect of some kind or other in the renal secretory apparatus—a kind of

* However, in another case of orthostatic albuminuria, namely, in a boy, aged 16 years, recently an in-patient at the German Hospital, Dr. H. Mendelsohn kindly tells me that artificial lordosis *in the recumbent position* failed to give rise to the presence of albumin in the urine.

defect which lasts only for a limited period (usually at least several years) during childhood and early adult life, and then gradually passes off. Such a theoretical functional defect would have to be supposed also to vary in degree according to the time of day, for it is only on a supposition of that kind that the occasional disappearance of the albumin from the urine in the evening before going to bed (*i. e.* the cyclical diurnal variation in the albuminuria) could be accounted for.

In conclusion, I wish to draw attention to the analogy between renal symptoms and cardiac symptoms from the point of view of prognosis. Just as grave myocardial changes may exist without obvious clinical symptoms, so also organic renal disease may be present in people who seem to be in good health, and whose urine is sometimes quite free from albumin. Just as young persons may present cardiac murmurs, palpitation, etc., in the absence of organic heart disease, so also they may pass albumin in their urine in the absence of organic renal disease. And just as an organically diseased heart may regain its functional activity and do all the work that it is called on to do, so in cases of parenchymatous nephritis with dropsy of long duration one may occasionally observe a kind of "urinary crisis" during which, in the course of a few days, the dropsy entirely disappears owing to the kidneys having recovered their functional activity, although remaining, of course, anatomically diseased.

TYPHOID FEVER IN CHILDHOOD: AN ANALYSIS OF ONE HUNDRED CONSECUTIVE CASES.

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While typhoid fever in children broadly resembles the adult type of the disease, it also exhibits certain characteristic differences. The following paper, based on the results of an analysis of 100 consecutive cases collected at the Queen's Hospital for Children, where children are admitted up to the age of twelve years, indicates the chief.

No attempt has been made to review all the known symptoms and possible complications which may accompany this complaint in

childhood, but rather to set forth the main features and some difficulties in diagnosis which are common to the disease at this age, and which are illustrated by the cases in this series.

Ætiology.—On the question of infection and its source the histories of these cases throw very little light. In the great majority the attack was an isolated one in the family, and its origin was untraceable. In some the child or children contracted the disease directly from some adult member of the family; in others a possible source suggested itself in the consumption of cheap ice-creams, shell-fish, and impure milk.

Sex does not appear to play any part in the incidence of this disease: fifty-one of the cases were girls and forty nine boys. Age, on the other hand, is an important factor.

There is no case in this series under one year of age. From this period to twelve years of age there is a steady increase in the number of children infected. This is well shown if we divide the period of twelve years into groups of three.

Age in years.	No. of cases.	Total in 3 years.	Age in years.	No. of cases.	Total in 3 years.
0–1	0		6–7	15	
1–2	3		7–8	9	
2–3	4	7	8–9	6	30
3–4	7		9–10	11	
4–5	12		10–11	16	
5–6	5	24	11–12	12	39

No season of the year is entirely free from typhoid fever, but the disease seems far more prevalent in the latter half of the year, and in the autumn especially. No less than 35 per cent. of the cases in this series occurred in September and October. The following table shows the months in which the cases occurred:

Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
9	3	5	7	2	7	5	8	20	15	11	8

The duration of the disease in children is exceedingly variable, and forms one of the peculiar features of typhoid fever at this age. In 12 of the 100 cases it was impossible to define approximately the date at which the child was first taken ill, but in the remaining 88 the time of onset could be more or less correctly arrived at.

Of these six lasted only 8 to 12 days, forty-three for a period varying from 15 to 21 days, while thirty-nine continued for 21 days and over. The shortest illness was 8 days and the longest 50. The average duration of the disease calculated from the date of onset to the termination of the pyrexia in hospital was 23·1 days.

From the shorter duration of the disease as evidenced by these

figures, and as we shall see later when studying the mortality from the lower death-rate, it is apparent that on the whole typhoid fever in children is a less serious disorder than the corresponding complaint in adults.

Onset and prodromal symptoms.—The onset at this time of life may be sudden, in which case the symptoms are not infrequently vomiting, which may be very severe and continuous, and diarrhœa. Vomiting as an early symptom, while unusual and rare in adults, is in children moderately common. In 3 per cent. of these cases this symptom is recorded as being exceedingly severe and persisting well into the disease. In 27 per cent. vomiting appears as a prodromal symptom, but was in the majority of cases limited to a few occasions at the onset. More often the onset is gradual, and the symptoms then differ little from those seen in the adult type of the disease. Anorexia, headache, cough and general malaise appear as early indications. Headache rarely exists in the severe form in which it occurs in older patients, and is often either entirely absent or so slight as to escape notice. It is mentioned as a symptom in only 64 per cent. of these cases. When severe, and associated, as it not infrequently is under these conditions, with nocturnal delirium, irrational screaming, mental irritability and photophobia, the disease presents a picture which is often mistaken for the early stages of tuberculous meningitis and other acute cerebral affections of childhood. Such a case was the following: G. N—, aged 6 years, was admitted for drowsiness, fitful screaming, vomiting and constipation. When seen the child lay curled up on one side, strongly resenting any interference and exhibiting marked photophobia. A preliminary diagnosis of early tuberculous meningitis was made. Later the abdomen became distended, the stools loose, the spleen enlarged, and rose-spots appeared. A positive Widal pointed to the correct diagnosis of typhoid.

Of the 100 cases 8 per cent. exhibited this meningitic type at the outset, while some 16 per cent. showed more or less marked mental irritability.

Diarrhœa frequently ushers in the disease, but rarely continues in any severe degree throughout the illness. It is not uncommon, on the admission of the patient for a parent to state that the child has profuse stools. This, however, if present, will be found to cease, or be easily controlled, on the adoption of routine typhoid treatment.

In addition to a sudden onset with vomiting, a gradual onset with general malaise, and the meningitic type, there exists also a

further distinct group in which the prominent symptoms are pulmonary. It exhibits itself generally as a diffuse bronchitis, the physical signs of which are usually not sufficiently marked to account for the associated severe disturbance and high pyrexia. Further examination in these cases may, at a later date, reveal a distended abdomen, large spleen, and rose-spots. Occasionally, however, headache, bronchitis and gradual emaciation form the only symptoms. Such a case was R. B—, aged 9 years, admitted for headache, general bronchitis, and slight diarrhœa. The stools were atypical, there was no enlargement of the spleen, nor spots. Gradual emaciation took place, the temperature remaining persistently high for a period of twenty-three days. The progressive wasting, associated with a remittent pyrexia and lung-signs, suggested at first general tuberculosis; a positive Widal and a rapid convalescence after the fall of temperature indicated the nature of the infection. In infancy itself the condition may suggest simply diarrhœa and vomiting, and it requires careful observation of a history of similar disease in older members of the family to arrive at a right conclusion.

In addition to these six distinct varieties, typhoid fever in children occasionally presents itself under the guise of other ailments. In this series two cases exhibited as their most prominent symptom a marked tonsillitis. In other two cases the only feature which had been noticed was a steady and marked emaciation. These latter cases had evidently been in progress for some time, and a diagnosis could only be made on the previous history and a positive Widal reaction.

Again, a child was brought to hospital suffering from a wide-spread œdema, mental irritability, albuminuria, and a history of illness of some days' duration. No casts were present at the time. In a day or two typical rose-spots appeared, and still later a positive Widal reaction was obtained. A large gluteal abscess in a child of apparently weak intellect in yet another case was shown to be the result of a previously existing typhoid. After surgical intervention convalescence proceeded rapidly, the mental aspect disappearing with a liberal diet and more generous surroundings of hospital.

In two other cases severe articular pain and slight delirium led to the provisionally wrong diagnosis of acute rheumatism.

Finally, one must always remember the possibility of typhoid occurring with scarcely any evidence of ill-health. As instances of this we have the two following cases, which were only discovered, one from the fact that her sister was suffering at the time from the

disorder in question, and in the other in the course of a routine out-patient examination :

(1) A. M—, aged 8 years. Feeling quite well; sister in hospital with typhoid ; no symptoms. Examination revealed a profuse crop of typical spots, and the Widal was positive. Temperature, which was 102° F. on admission, fell to normal in nine days.

(2) M. K—, aged 8½ years, admitted for slight headache. Constipation, and a profuse crop of spots. Temperature was often normal, never above 100° F. Duration of illness from temperature chart was twenty-one days. Never felt ill at any time, and was extremely indignant at being detained in bed. Widal positive.

Symptoms during the course of the disease.—The symptoms occurring during the course of a severe attack of typhoid in a child present very little difference from those seen in a moderately severe attack in the adult. Apathy, drowsiness, flushed face, with slight circumoral pallor, the tongue with its typical appearance, the presence of spots from the sixth to the eighth day onwards (present in this series in 64 per cent. of cases), the slight doughy distension of the abdomen and splenic enlargement (present in 51 per cent.), and the cough and scattered moist sounds in the lungs, all find a place in the typhoid fever of childhood.

Apathy and drowsiness rarely if ever proceed to the stage of stupor and coma seen in adults. Delirium is present, nocturnal in time, hardly ever occurring by day, usually quiet and muttering in character, but at other times it may be violent and noisy, and associated with hallucination of sight and delusions.

Subsultus, like stupor and coma, is very uncommon, and when present usually suggests a fatal termination. It was present in three cases in this series, and two were fatal.

Abdominal pain is sometimes present, and occasionally so severe as to simulate acute abdominal disease : *e. g.* B. B—, aged 5 years, admitted for severe abdominal pain, had definite tenderness most marked over the appendix. He cried with the pain, and kept his legs drawn up. Later he had typical signs and symptoms of typhoid.

Pulmonary symptoms are often absent, a varying degree of bronchitis, and in the more severe cases slight hypostatic congestion are all that are present.

Emaciation is a constant feature, and is as rapid as is the gain in weight when once convalescence commences.

Progress and complications.—With the onset of the third week arise such complications as occur in this disease in childhood.

The general symptoms of this period differ little from those of the second week, prostration and emaciation are more marked, and evidence of myocardial trouble is indicated by an increasingly rapid, feeble, irregular, occasionally dicrotic pulse. Examination of the heart at such a time will reveal a soft or muffled first sound, sometimes increased cardiac dulness, but rarely any adventitious mitral murmur.

In this series 17 per cent. of the cases showed more or less myocardial trouble calling for treatment. Slight affection of the myocardium is probably the commonest complication that occurs in typhoid fever in children, and demands careful watching and judicious stimulation. Sudden heart failure appeared as the only cause for death in two of the seven fatal cases in the series.

Cyanosis, not uncommon in the severe adult type, is mentioned only twice in these 100 cases.

Pulmonary complications are not of common occurrence. Pneumonia, pleurisy, and empyema, however, find a place in the series. Definite pulmonary consolidation is recorded in five cases. The pneumonia in nearly all instances occurred at the end of the second or beginning of the third week, and appeared to be pneumococcal in origin. Such a case at all events was the following:

W. W—, a boy, aged 6 years, with an apparently mild attack of typhoid. The temperature, which had been low throughout, was actually normal on the tenth day, rose gradually to the fifteenth day, when the child developed signs of pneumonia in both lungs, and died rapidly on the seventeenth day of illness. An examination of the blood and spleen yielded a mixed infection of pneumococcus and *B. typhosus*.

In a second case, lobar pneumonia, appeared as the only prominent symptom. A girl, aged 10 years, whose sister died in the hospital of typhoid fever, which was confirmed post-mortem, was admitted the day following the death of her sister with vomiting, abdominal pain, and cough, all of sudden onset. The spleen was enlarged and nocturnal delirium was marked. On examination there was complete consolidation of the right lung. A Widal reaction taken twice proved positive on both occasions. The temperature, 104·6° F. on admission, ran a continuous course for seven days, and terminated by crisis. There were no symptoms previous to illness, and none followed it.

The positive Widal reaction and the history of infection leave little doubt that this child was suffering, or had suffered, from a mild attack of typhoid, which had culminated in an attack of pneumonia.

In the third case double pneumonia occurred in a child, aged 4 years, on the thirtieth day of the disease, and was followed in twelve days by cancrum oris and empyema, and a fatal termination.

In the fourth case pneumonia appeared during the course of a severe illness of forty-two days' duration, in which hæmorrhage from the bowel and severe myocarditis were prominent features. This case recovered.

The fifth case was one of moderate severity only, which ran a typical course to a successful termination.

Pleurisy is mentioned once in the series. A girl, aged 6 years, during the second week of a severe but non-fatal case of typhoid fever, developed a well-marked pleuritic rub over the right lung, which was audible for some days. No effusion formed, so that cultivation was impossible. It is interesting to note in this case that a von Pirquet reaction proved positive. This, though of little value, raises a point which must not be forgotten, namely, that tuberculosis may be a sequela of typhoid fever.

Empyema occurred once, and is mentioned in the third case of pneumonia above.

Nephritis, dependent on the typhoid infection, appears to be very rare in childhood and infancy. Sixteen cases presented a varying degree of albuminuria. This albuminuria, sometimes of only twenty-four hours' duration, persisted in other cases, throughout the whole pyrexial period. No blood-casts or other evidence of nephritis, however, occurred.

Blood, pus, albumin, and frequency of micturition are reported in four cases in the series, towards the end of the pyrexial period, or during convalescence, and in all cases was found to be due to the presence of a Gram-negative motile bacillus in the urine, which in two cases was definitely identified as the *Bacillus coli*.

Retention of urine occurred only once, and necessitated the use of a catheter for six days.

Otorrhœa and deafness are not uncommon complications, and usually occur towards the end of the illness. Ear discharge manifested itself in eight cases during a period covered by the fourteenth day to the fifth week.

Deafness occurs apart from actual suppuration, and is nearly always entirely recovered from. Three cases in this series exhibited marked temporary deafness appearing in the second and third weeks and on the thirtieth day respectively.

Parotitis appears twice in the series. In the first case the swelling was a simple non-suppurative enlargement. In the second, inflam-

mation appeared in both parotid glands on the fourteenth day of illness, and was followed by a diffuse cellulitis of the neck, which culminated in death on the twenty-fifth day of illness.

Active delirium, hallucination, and delusions have been mentioned as occurring occasionally. This mental condition is indicated by rambling speech and an entire misapprehension of the nature of objects surrounding the bed or cot. With this occur occasional loud outbursts of shouting and attempts to bang the head or limbs against the sides of the cot. In three cases in this series drowsiness and apathy gradually passed into a state of mental depression closely akin to melancholia. The child in each case was entirely prostrated with every indication of complete muscular enfeeblement, its expression was miserable and woebegone; any question or remark called forth only sobs and tears. In this state actual aphasia may occur. Mental depression rarely occurs apart from a long and severe illness, and usually manifests itself about the third or fourth week; it frequently persists into convalescence, but generally disappears with the institution of more liberal feeding.

In addition to these two states of mind a condition of dementia exists. One case in this series exhibited this. The child in question, aged 10 years, had previous to admission suffered from a long, severe, and undiagnosed illness, in which headache, diarrhœa, and vomiting had been prominent symptoms. On examination he was extremely emaciated, his skin was desquamating, and he was suffering from cystitis. His mental condition was dull and apathetic, his expression vacant and almost fatuous, his manner and behaviour that of an infant. His blood gave a positive Widal reaction, and with hospital treatment and a generous diet he rapidly recovered in all respects.

Other symptoms possibly nervous in origin appear in four instances in this series. They consisted of, indefinite, but occasionally severe pains affecting the lower limbs. It is difficult to judge whether they are muscular or of the nature of a mild neuritis. Sometimes also there is an obstinate refusal of food, which necessitates nasal feeding; this occurred in three cases.

Suppuration in the bony, muscular, or connective tissues of the body finds place in this series in one instance only, and is generally rare in childhood. This was the case of gluteal abscess mentioned above.

Abscesses in the skin and multiple boils are not uncommon. They occur practically always at the end of the illness and very often during convalescence. There are six such cases in this series,

three of which commenced in convalescence, the others on the seventeenth, twenty-seventh, and thirtieth days of illness.

The important group of alimentary complications of such fatal interest in the adult have been left purposely to the end.

It is commonly accepted as a fact that hæmorrhage and perforation are but infrequently present in childhood and infancy. This without doubt accounts for the low mortality which exists at this age, and it finds an explanation in the fact that the ulcerative stages of the pathological changes which the intestine undergoes are not always reached. Evidence of this has been forthcoming in necropsies on fatal cases dying at a time when such changes should have been present. In nearly 50 per cent. of the cases in this series recovery took place at the end of the second or during the early days of the third week. Swelling and perhaps slight superficial ulceration of Peyer's patches is probably all that occurs in these cases. Such a condition is more frequent in young children. As age advances the pathological changes, and consequently the risk of perforation and hæmorrhage, tend to approach more nearly in character to those present in the adult forms of the disease.

In four of the seven fatal cases in this series in which ulceration was present post-mortem the children were over six years of age. In the two fatal cases of perforation the children were aged respectively eleven and twelve years. In the first of these two cases death followed the perforation, which took place on the thirty-sixth day, almost immediately. In the second, which occurred on the twenty-seventh day, the diagnosis was not made until the onset of general peritonitis.

Hæmorrhage from the bowel is mentioned in seven instances, in four of which it was slight, giving rise to no symptoms and needing no treatment. In three it was severe, not fatal, but associated with usual collapse symptoms. In these last three cases the hæmorrhages occurred on the twenty-second, twenty-fourth, and twenty-fifth days respectively of the illness. Two of these severe hæmorrhages occurred in the cases mentioned above as dying of perforation. The third, a very severe case of typhoid in a girl, aged 10 years, eventually recovered.

Hæmorrhage and perforation therefore appear as complications in the later ages of childhood, and these cases support the view that ulceration of the bowel is more frequent at this age than in the early years.

Vomiting has been already mentioned as a prodromal symptom, but it also occurs during the course of the disease. In such cases

it may be due to errors of diet or implication of the peritoneum, as in perforation. On the other hand it occasionally appears without obvious explanation. It rarely occurs in other than severe cases, and where frequent or repeated is often of fatal significance, as is shown by the following case:

R. B—, aged 1 year and 4 months, a female infant, whose mother, brother and sister were all in hospital for typhoid fever, was admitted with typical symptoms, *e. g.* rose-spots, enlarged spleen, distension of the abdomen, irritability and diarrhœa. She vomited frequently while in hospital and died suddenly eighteen days after admission. Post mortem there was no evidence of perforation or peritonitis and an examination of the small intestine revealed only swelling of Peyer's patches and no ulceration. No treatment or diet influenced the vomiting in this case. In a second case, which gave evidence of severe myocarditis, vomiting occurred throughout the disease, but recovery took place.

Meteorism is not frequently met with to such a degree as to require treatment. Only three cases in this series called for relief owing to severe abdominal distension.

Careful attention to the mouth usually prevents stomatitis and ulcerative conditions. Failure in this direction is no doubt responsible for adenitis, parotitis, and perhaps cancrum oris. The two cases of parotitis and cancrum oris have already been mentioned.

Sordes and a dry, brown, glazed condition of the mucous membrane and cracked, bleeding lips are not infrequently present in some cases. The stools in the typhoid of children, on account of the variable appearance and consistency, are exceedingly difficult to classify. As we have shown before, diarrhœa, while frequently present in the stages previous to the commencement of treatment, is usually absent to any marked degree in the majority of cases during the course.

In 81 cases in this series I have attempted some sort of a classification. Of these, 18, or 22 per cent., were said to be typical. In 15, or 18 per cent., there was constipation. In 14, or 17 per cent., the stools were green, undigested, and offensive. In 28, or 34 per cent., there was some degree of diarrhœa, the stools being loose, grey or brown in colour, and foul smelling. In only 6 of these was the diarrhœa so excessive as to call for urgent treatment. In the remaining 6, or 7 per cent., the stools were normal in appearance and consistency throughout.

Convalescence in the child is as a rule rapid and uneventful, and is associated with rapid gain in weight. Occasionally nervous

complications, bacilluria, or cutaneous abscesses persist for a while. Desquamation is sometimes copious. Irregularity of the pulse to those that are unaware of the frequency of this phenomenon after any acute illness in childhood is occasionally a cause for unnecessary alarm. Constipation as a rule will prove to be the only difficulty. Relapses, on the other hand, do occur, and are usually, of shorter duration and less severe than the original attack. Eleven per cent. of the cases in the series had a typical relapse of varying duration. The shortest of them was five days, the longest nineteen days. The shortest interval between the original attack and the relapse was one day, and the longest eleven days. In one or two cases the temperature chart seemed to point to an overlapping of first and second attacks, but these have not been included in the above number. In five of the eleven cases there was a repetition of some of the symptoms of the previous attack, *e. g.* spots, enlargement of spleen, headaches and drowsiness.

In addition to these relapses there occur occasional irregular and shorter pyrexial periods which appear to be due to increase in diet or constipation and other causes not always obvious. In one case more than six such periods occurred of one to twenty days' duration each, which were eventually proved to be due to a *B. coli* infection of the urine.

The pyrexia in the typhoid of children is on the whole almost as atypical as the stools. As in adults, it may be so slight as almost to escape recognition. Three cases in this series exhibited a maximum temperature of only 100°. In the ordinary course of the disease we meet with three distinct types, two of which are very different from the regular type of the adult disease. These may be classified as (1) continuous; (2) intermittent and irregular; (3) remittent. The younger the child the more likely is the temperature to be remittent or irregular. This is exemplified by the following: Twenty-four cases in the series were taken at random; of these, eight could be described as continuous, eight as intermittent and irregular, and eight as remittent.

The average age of the eight cases with continuous fever was 9·2 years, that of the irregular and intermittent 7·2 years, that of the remittent 6·8 years. From these figures also it would appear that the temperature is more often remittent and irregular than continuous.

In one case, a child aged 2 years and 4 months, the temperature was of the inverted type—normal at night and raised in the morning. In the great majority of cases in children there is

usually a considerable morning remission. Rigors are mentioned in 6 per cent. of these cases. In two of these the rigors occurred in association with suppuration, in the one case a dental abscess, in the second in a fatal case of suppurative parotitis. In two cases the disease itself seemed to end suddenly with a rigor and crisis, the temperature dropping suddenly and remaining normal. In the remaining two, rigors occurred on the seventeenth and twenty-first days of illness respectively, and their cause was not apparent: one appeared to follow the administration of an enema. The extent of the pyrexia is not always a gauge of the severity of the disease. In an infant aged 1 year and 4 months, who died after eighteen days' illness in hospital, the temperature was never above 102° F., and again, in the case of a boy, aged 6 years, who died of typhoid and pneumonia, the maximum temperature recorded was 101·8°.

Prognosis.—On the whole this may be said to be good. It is impossible to determine at the beginning of the illness which way a case may travel. Each case must be judged on its own merits. In this series death took place in seven instances from the following causes: perforation, 2; toxæmia, heart failure, 2; pneumonia, 1; suppurative parotitis, 1; pneumonia, empyema, cancrum oris, 1.

Diagnosis.—As in the adult type of the disease, Widal's serum reaction plays an invaluable part in the diagnosis of obscure cases. In 76 cases in this series the records of this examination are preserved. Of these, 58, or 76 per cent., gave a positive reaction, 4 a partial, and 14, or 18 per cent., a negative result. Of these latter only one was repeated, and again proved negative; in the remainder all the clinical signs of typhoid fever were present, and further examination was omitted. If this method fails, confirmation of the diagnosis in a difficult case may be sought by means of a blood-culture. We have seen that typhoid in its early stages may simulate various acute pulmonary meningitic and abdominal conditions, and *vice-versâ*, such states may be mistaken for typhoid. Difficulty arises in acute lung disorders where the signs are, on the one hand, diffuse, or on the other deep seated and absent; in addition, there is not infrequently abdominal distension, vague pains and enlarged spleen, and a high temperature. Solution must be sought in these cases in the characteristic quick, shallow, grunting respirations, the presence of a leucocytosis, and in a day or two evidence of typical local consolidation, or a sudden termination of the illness by crisis. On the other hand, typhoid will be

revealed by the appearance of spots, a leucopenia, and later by a positive Widal.

Other pneumococcal affections may simulate typhoid, such as pneumococcal meningitis and peritonitis. The first is quickly distinguished by its rapidly fatal course, at the most usually four or five days, and by the purulent cerebro-spinal fluid teeming with pneumococci.

Pneumococcal peritonitis, with its drowsiness, slight abdominal pain, moderate distension and tenderness, ushered in by diarrhœa and vomiting, will often only be discovered in the absence of a reliable history when the symptoms of general peritonitis are fully manifested.

Various tuberculous affections are sometimes mistaken for typhoid fever. General tuberculosis, whether as a meningitis or in its pulmonary or abdominal form, is occasionally a stumbling-block. Differentiate the first by its lower temperature, which may not be elevated at all until the end, the retraction instead of distension of the abdomen, the drowsiness and apathy rapidly passing into coma, and the presence of fleeting paralysis. Lumbar puncture will reveal an excess of fluid, a slight leucocytosis, and perhaps the tubercle bacillus.

The pulmonary type with its prostration, apathy, cyanosis or pallor, the diffuse, moist sounds in the lungs, the not infrequent enlargement of the spleen, and diarrhœa, is much more difficult. The temperature is, as a rule, lower and more remittent than that of typhoid; the presence of other tuberculous lesions, glands in the abdomen and neck, or the development of choroidal tubercles, should help to the correct diagnosis.

The abdominal type, whether ascitic or plastic, should afford very little difficulty to a careful observer. Free fluid, thickened omentum and enlarged glands, colicky pains, with increasing distension of the abdomen and progressive emaciation, often with little or no temperature, form a picture hard to mistake for typhoid fever. In the more obscure cases the long duration of the illness and the absence of all signs of typhoid should lead to a suspicion of tubercle.

Sundry acute cerebral affections, such as epidemic cerebro-spinal meningitis, acute encephalitis, and acute otitis media, can be determined easily by localising symptoms and an examination of the respective cerebro-spinal fluids.

More difficult occasionally are various abdominal conditions. Acute pneumococcal peritonitis has been mentioned. No hesitation

should occur in the diagnosis of acute appendicitis; failure to recognise this condition or secure immediate operation involves a grave responsibility. Constipation is a frequent source of error. Cases commonly occur of profound headache, abdominal distension, pain, drowsiness, vomiting, and raised temperature. Sometimes the spleen is enlarged, in which, until the administration of one enema or more, a diagnosis of typhoid has been confidently made.

Infection of the urinary tract by the *Bacillus coli*, where there is sometimes no localising symptoms, but only high temperature, indefinite abdominal pain, general malaise, mental irritability and drowsiness is another source of error. An examination of the urine will reveal the presence of pus and quantities of the offending organism. In other cases enlargement and tenderness of one or other kidney will be found on palpation.

During the period in which these 100 cases were admitted 40 cases were admitted with the provisional diagnosis of typhoid fever and later proved to be wrong. Ten cases also were admitted for other disorders and proved to be typhoid. They are interesting as illustrating the question of diagnosis above, and as such they are tabulated below:

1. *Cases admitted as Typhoid but Due to Other Diseases.*

Disease.	No. of cases.	Disease.	No. of cases.
Constipation	11	*B. coli* pyelitis	2
Tuberculous meningitis	4	General bronchitis	1
Lobar pneumonia	3	Pneumococcic peritonitis	1
Apical pneumonia	2	Acute otitis media	1
Tuberculous peritonitis	2	Pericarditis	1
General tuberculosis	2	Influenza	1
Diarrhœa	2	Pyrexia of uncertain origin	7
Total	26	Total	14

2. *Cases admitted under Different Headings and Due to Typhoid.*

Disease.	No. of cases.	Disease.	No. of cases.
Constipation	1	Acute rheumatism	1
Tuberculous peritonitis	1	Follicular tonsillitis	1
Broncho-pneumonia	1	Appendicitis	1
Lobar pneumonia	1	General bronchitis	1
General debility	1		
Tuberculous meningitis	1	Total	10

In the first series two of the cases under the heading of "Constipation" had an illness of ten days' duration, in which figured a large spleen, headache, abdominal pain, drowsiness, and both yielded a partial Widal. Such cases may have been possibly paratyphoid infections.

Treatment resolves itself into absolute rest, good nursing, and careful dieting. Drugs have no influence on the course of the disease. All treatment is symptomatic. The diet should be principally milk given two hourly in 2–5 ounce feeds. Such feeds may be slightly thickened with plasmon or Benger's or their nutritive value increased by the addition of lactose ʒj to each feed. Where constipation is troublesome one feed in three may be some meat extract, such as beef-tea, veal-tea, or chicken broth. If the stools are undigested the milk may be citrated, and if that fails, peptonised. Children take the latter badly, and the unpleasant flavour may be remedied by adding a small quantity of malt extract. Some form of diuretic is useful and palatable to the patient, such as imperial drink or fresh lemonade. If diarrhœa persists and is excessive, tinct. opii ♏v–xv in two ounces of starch given as an enema is usually sufficient. Meteorism is frequently relieved by small quantities of salol, one grain for each year of life up to five grains given *ter die.* Ol. cinnamom. ♏j in mucilage has other advocates. Where there is constipation an enema every third day will be all that is necessary. Myocarditis, if severe, as evidenced by a feeble and irregular pulse and muffled first sound, should be treated by strychnine, either hypodermically or by mouth, and brandy may be given in quantities, *cf.* ʒiij–xij in the twenty-four hours, in divided doses according to age. Hæmorrhage rarely needs treatment, and perforation requires the surgeon. The toilet of the mouth is most important; listerine, glycerine and chinosol, glycerine borax and myrrh, or other antiseptic remedies, should be constantly applied. The greatest gentleness should be used in swabbing the delicate epithelium of the child's mouth. Too energetic measures not infrequently do more harm than good by causing abrasions, which allow the entry of septic micro-organisms. The greatest care should be taken with soiled linen and in bathing the patient regularly. Where restlessness, delirium, and high temperature are prominent features, sponging with tepid or cold water will usually produce immediate relief. Children bear extremes of temperature exceedingly badly. Cold baths and ice are not to be recommended. In the majority of cases attention to the diet and bowels will be all that is necessary.

THE SURGICAL ASPECTS OF ACUTE ABDOMINAL DISEASE IN CHILDHOOD.*

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(*Continued from p.* 359.)

Inflammation of the Diverticulum of Meckel: Diverticulitis.

Statistics showing the frequency of the persistence of the omphalo-mesenteric duct vary, but it may be said that the duct persists in some part in about 2 to 4 per cent. of bodies. Its most frequent site of attachment is to the convex border of the ileum about 39 inches above the ileo-cæcal valve, *i. e.* to a portion of the intestine which may be assumed to occupy the lower abdomen or the pelvis. This site of attachment is by no means constant, for it may be found higher or lower in the small gut; it is stated that it has been seen in the duodenum and in the large gut. But in all probability diverticula attached to these portions of the bowel permit of a different origin, and are not the diverticula of Meckel.

The anomalies of Meckel's diverticulum are various, but the only one which concerns us in this connection is that in which the diverticulum is represented as a true appendix to the ileum—the ileal appendix, as it may be termed in comparison with the appendix vermiformis, which may be regarded as the cæcal appendix—possessing a lumen communicating more or less freely with that of the bowel from which it springs.

One of the earliest records of this disease is that by Houston in 1834, who described a typical case of chronic inflammation of the diverticulum. In 1847 Denucé records the autopsy upon a man who died of peritonitis due to the perforation of the diverticulum of Meckel. In 1851 Beale described a similar case. Galton, in 1872, records the autopsy upon a child who died from typhoid fever; a perforation of an ulcer was present at the extremity of the diverticulum. Fitz, in 1884, showed a Meckel's diverticulum with three large tuberculous ulcers. Picqué and Guillemot, in 1897, record one of the earliest operations, this being undertaken for supposed appendicitis. These are amongst the earliest authors to point out the similarity between this disease and appendicitis. Blanc, in 1899, wrote a thesis upon the subject, recording nineteen observations. Since then the records of cases have multiplied, and many

* A paper read before the Richmond Division of the British Medical Association on April the 26th, 1911.

papers have appeared upon the subject, amongst which may be mentioned that by Denecke in 1902, by Hilgenreimer in 1903, and Cahier in 1906. In 1907 Forgue and Riche published a monograph upon the diverticulum of Meckel, in which considerable space is given to inflammation of the structure. It is seen from this brief *resumé* of the literature that the disease, although by no means frequent, has attracted a considerable amount of attention. It is also to be noticed that the diverticulum is liable to be affected by diseases similar to those affecting the intestine from which it arises, viz. typhoidal and tuberculous ulcers, in addition to the acute infection by pyogenic bacteria. Diverticulitis is, of course, not limited to the child; indeed, the most frequent age appears to be between fifteen and twenty-five years of age, only about 3 per cent. of recorded cases having occurred under ten years of age.

A careful distinction must be drawn between primary and secondary diverticulitis. By primary diverticulitis I mean that the inflammation is the first lesion; by secondary an acute infection of the diverticulum occurs consecutively to some gross vascular disturbance, as when the diverticulum forms a part of a constricting band by which a coil of gut is snared, or is strangulated in a hernial sac. It is only the primary form which concerns us now.

In some respects the ileal diverticulum resembles the cæcal diverticulum, but even if the resemblance were perfect, diverticulitis could be nothing like so frequent an occurrence as appendicitis, since the diverticulum is only present in 2 to 4 per cent. of bodies. The resemblance is, however, very imperfect. The appendix is attached to a portion of the bowel where normally some delay in the contents occurs, and where the growth of micro-organisms is known to be very free, whereas there is no delay in the contents at the site of attachment of the ileal appendix. The appendix has a relatively narrow lumen, and perhaps sometimes a valve guarding its orifice impeding the escape of its contents; this is not the case in the ileal appendix where in the majority of cases the lumen is of considerable size and the aperture of communication is as large. The appendix is a more fixed structure by the arrangement of its peritoneal connections to the cæcum and to the mesentery, whereas the ileal appendix (in the majority of cases where diverticulitis has been recorded) is attached to a movable portion of the bowel, and is not fixed by any mesentery, and only unusually by a band representing the distal remains of the tube or the omphalo-mesenteric vessels. The cæcal appendix contains much lymphoid tissue and relatively very thick muscular walls, whereas the

lymphoid tissue in the ileal appendix is very sparse and the muscular walls are very thin in proportion to the width of the lumen of the tube. In some specimens the muscular coverings of the diverticulum are deficient in part, and the mucous and peritoneal coats are in apposition; hence when infection does occur it is easy to see how early diffuse peritonitis may arise.

It is difficult to conceive what factors predispose to diverticulitis. In the majority of cases, as already mentioned, the opening of communication with the bowel is quite as large as the lumen of the tube. It is true that in a few instances of Meckel's diverticulum there has been observed a very material narrowing of this aperture, and even a valve has been seen to guard it—this was observed by Meckel himself—but such conditions are unusual, and have rarely, if ever, been recorded in cases where the diverticulum has been inflamed. If such were present it could easily be inferred that some impediment to the free escape of contents might ensue and predispose to infection. The diverticulum is very commonly fixed, either directly or by the medium of a fibrous band (the omphalo-mesenteric cord) to the umbilicus, or if this connection has been lost a secondary adhesion may fix the diverticulum to the mesentery or peritoneum elsewhere. Such fixation might in the various movements of the bowel and diverticulum tend to kink the latter and produce a hindrance to drainage and predispose to infection. But it is a noteworthy fact that in the majority of cases in which diverticulitis has been recorded such fixation has been absent. In one of my cases such a band was distinctly present. Foreign bodies, such as fish-bones, apple-seeds, or round-worms have been found in the ileal appendix (and the large size of the aperture of communication with the bowel renders their entry an easy matter). These tend to occlude the orifice, and hence would predispose to infection. Indeed, this association has been recorded more than once. Fæcal concretions have also been observed in association with diverticulitis, but whether these had entered from the bowel or were directly due to inflammation of the diverticulum it is not easy to determine. Rarely trauma has been held responsible, as it has for the development of appendicitis, and cases are recorded where diverticulitis occurred within a few hours after some injury to the abdominal wall. There is no doubt that the diverticulum may share in the several diseases of the bowel from which it springs, for tuberculous ulcers and typhoid ulcers have been recorded. It may be noted in this connection that diverticulitis has occasionally been preceded by chronic gastro-enteritis, habitual constipation, gastric

troubles and indigestion. But it is not certain whether such symptoms might not have been produced by a chronic inflammation of diverticulum. In those instances where the wall of the diverticulum is very thinned and perhaps deficient partly in its muscular covering, and where little recesses or small secondary diverticula are present, a little accumulation of intestinal contents in such pouches might easily excite an infection. But such are very rare. When all has been said it is by no means certain why diverticulitis should arise unless some fixation or kinking of the tube is present, and judging from recorded cases this is unusual. Very rarely has the diverticulum been seen snared by a band, and equally rarely is the diverticulum attached to the bowel-wall, as it were, by a pedicle, and the latter has undergone torsion. In such rare instances it is easy to understand the occurrence of an acute infection.

Clinically diverticulitis resembles appendicitis. We recognise, as in the appendix, the simple resolving inflammation which leaves its impression upon the diverticulum, the localised abscess, and the diffuse peritonitis; also the relapsing form may be recognised, and when once the diverticulum has been inflamed, probably it becomes fixed by inflammatory adhesions, and hence is predisposed to further disease. The clinical picture of each variety is precisely similar to that of appendicitis, and from it cannot be differentiated. I am not aware that a correct diagnosis has been made in any case. If we have an opportunity of seeing such a case in the early hours of the illness, we should have the history given of abrupt abdominal pain, perhaps vomiting, some fever, and local tenderness and muscular rigidity. The confusion with appendicitis is enhanced, since the diverticulum will lie probably in the lower abdomen towards the right side, precisely in the position in the appendix. If an abscess forms, the swelling will occupy the right lower region of the abdomen in all probability. There are exceptions to this; the abscess may be more median in position or may occupy the lower left region, but an appendicular abscess may also occupy such positions, and the differential diagnosis is practically impossible. In the ultra-acute cases diffuse peritonitis will be diagnosed, and will be considered of appendicular origin, as this is the most frequent cause. If symptoms relapse, recurrent appendicitis will, in all probability, be diagnosed, and an operation undertaken accordingly. Relapsing diverticulitis has been very rarely recorded in the child.

The *treatment* is similar to that of appendicitis. Early operation is essential for the same reasons as it is in appendicitis. If this early operation be performed, almost certainly it will be undertaken

upon the belief that the appendix is at fault. When, after exposure, the appendix is found to be healthy in the child, the two conditions which should at once be thought of are pneumococcal peritonitis and diverticulitis.

Intussusception.

Intussusception in frequency is second only to appendicitis as an acute abdominal disease in childhood demanding immediate operation. The vast majority of intussusceptions concern the ileo-cæcal region: this was so in twenty-six of my twenty-eight cases. In one exception the invagination commenced two inches beyond the valve in the colon, and in the other the intussusception was entirely enteric. In the majority of cases the ileo-cæcal valve forms the apex of the invagination, although in many of such, after reduction of the ileum, it is seen that the caput cæci is inverted into the cæcum; this, however, is not the primary invagination. Less frequently the invagination commences in the lower ileum, the so-called ileo-colic variety.

Before the occurrence of the intussusception the children have been almost invariably in perfect health; occasionally a little bowel irregularity has been recorded. In no case was a tumour found as a cause of the invagination.

Early infancy is the most common age for intussusception. In no less than twenty out of twenty-eight cases the baby was under twelve months of age, and of these nine were under six months.

The *symptoms* of an intussusception are well known. The abrupt onset, with paroxysmal screaming fits of pain, perhaps vomiting (but this is very inconstant), the sudden collapse and the passage of blood and mucus by the bowel are regarded as the cardinal symptoms. None of these symptoms are, however, distinctive, but are merely suggestive. Perhaps the sign which has been considered as most distinctive is the passage of blood and mucus *per anum*. I would point out that this is not present until some hours after the commencement of the invagination. Indeed, in my experience it is rarely noticed until five or six hours have elapsed. In some of my cases it has not been present for ten, twelve, seventeen, and thirty-six hours after the initial symptoms. In one case it was delayed until the sixth day, and in some cases I have operated before its occurrence, although the blood has been present in the bowel as it has been voided after the operation.

There is *one sign* of an intussusception, and that is its palpation. The tumour of an intussusception is quite characteristic. The

elongated and rounded shape, the alternate hardening and softening and the mobility are almost diagnostic. The abdominal wall is perfectly lax save when the infant is crying, and between the paroxysms of pain the tumour may be palpated with ease. If the infant cannot be pacified and symptoms suggest an intussusception a whiff of anæsthetic should be given; the merest whiff will suffice, and this is all that should be given, for any anæsthetic adds materially to the shock. This, however, will rarely be found necessary. At what period in the stage of the disease this tumour can be felt must be variable. I take it a certain amount of swelling of the intussusceptum must be present before a distinct tumour will be palpated. The earliest case of intussusception which I have seen was two hours after the onset of symptoms and there was no doubt about the tumour then. In twenty-six out of the twenty-eight cases I have felt this tumour without any uncertainty whatever. In the two cases in which the tumour was not felt there was an obvious reason. In one the intussusception had been present for four days, and in the other two weeks before coming under observation. In both the abdomen was very considerably distended, and the intussusception, lying behind many layers of distended intestinal coils, was entirely out of reach.

Intussusception is a disease which we have an opportunity of seeing in its early stages in the majority of cases. Parents recognise at once that there is something seriously wrong and seek advice without delay. The key to the *diagnosis* is, to my mind, entirely in the palpation of the tumour. I believe it can practically always be felt. Occasionally, however, one reads of cases in which an intussusception was concealed under the ribs, and could not be palpated. Such cases, however, must be very rare. For if one considers the method of spread of an intussusception commencing in the ileo-cæcal region, it will have assumed some proportions when it reaches to the ribs, and it is inconceivable almost that a portion of the tumour might not be felt. There is practically only one condition with which it may be mistaken, and this is, fortunately, as far as we know, a rare condition. I refer to what Dr. Sutherland has called "gastro-intestinal crises from effusion into the bowel-wall" ('Proc. Roy. Soc. Med.,' 1909, ii, Med. Sect., p. 265). Occasionally it happens that a child is affected abruptly with the symptoms which suggest an intussusception, viz. the colicky pain, vomiting, and the passage of blood by the bowel. I have seen three such cases. Not feeling the tumour upon which I rely for the diagnosis of an intussusception, I did not operate. The symptoms disappeared very quickly. At the time I was inclined to regard such cases as

examples of the spontaneous reduction of an intussusception, not being able to offer any other solution. Although there is evidence to show that an intussusception may undergo spontaneous reduction, I think the majority of such cases are explained by the occurrence of a hæmorrhagic effusion into the bowel-wall, some of which escapes into the lumen of the bowel and is passed through the anus. Why such effusion occurs it is not easy to say. The condition appears to be frequently associated with Henoch's purpura, *i.e.* a variety of the hæmorrhagic diathesis associated with attacks of abdominal pain and the passage of blood *per anum*. In some such recorded cases the diagnosis is simplified by the simultaneous occurrence of hæmorrhages into the skin, the presence of joint signs, and perhaps a little fever. In others, however, the cutaneous lesions may not occur until after the intestinal crises. In others, again, the cutaneous lesions may be entirely absent. The effusion may be large enough to occlude the lumen of the bowel, and intestinal obstruction may be present; and furthermore, the hæmatoma into the bowel-wall may be felt as a tumour which has very similar characteristics to that of an intussusception. In the absence of a tumour I should hesitate to diagnose an intussusception. When a tumour is present and other signs of purpura are absent, I know of no means by which a differential diagnosis may be made. When a tumour is present and cutaneous signs of purpura are also present, the natural inference is that the tumour is not an intussusception, but a hæmorrhagic effusion into the bowel-wall. But a word of warning is necessary, for the two—effusion into the bowel-wall and an intussusception—may co-exist, the effusion into the bowel-wall being the direct cause of the intussusception. I know of no way in which a certain diagnosis may be made, unless it be that an intussusception will tend to increase and extend further along the bowel, and hence its position will more or less rapidly change. It is probable that a hæmorrhagic effusion into the bowel-wall may be the starting-point of an intussusception more frequently than is supposed. In one of my cases symptoms had been present for four days, in one six days, and in one seven days. In all three there was an entire absence of any abdominal distension, and the intussusception was reduced with comparative ease. In these it appears probable that the early signs might have been caused by hæmorrhage into the bowel-wall, and the intussusception was quite a recent occurrence.

The only *treatment* I have practised is reduction of the intussusception through a laparotomy wound. But previous to this I

make it an invariable rule to administer saline infusion subcutaneously. This improves the condition of the infant very greatly, and tends to render the shock of the operation much less. If necessary this saline infusion can be continued during the operation, and in the majority of cases it is advisable to repeat it after operation. Rectal infusion is not well tolerated in an infant, and is prohibited in these cases of intussusception, for it tends to be voided almost at once with the blood and mucus which is present in the bowel.

The *prognosis* of an intussusception is quite good. Twenty-three of my twenty-eight cases recovered. Of the five fatal cases, three were instances of irreducibility in infants. In the two fatal cases where reduction was possible, in one symptoms had been present for four days, and the babe was extremely ill, with a very distended abdomen. Practically all such cases in infancy are fatal. In the other, although symptoms had only been present for seventeen hours, the infant was, contrary to the rule, wasted, and in very poor condition.

In only one instance did a child at a later period again suffer from an intussusception. This was a child upon whom I operated on three separate occasions, at intervals of three months or so, for an ileo-cæcal invagination.

Excluding intussusception, *intestinal obstruction* is not common in the child. Perhaps obstruction by a band and by adhesions are equally common in frequency. The band is practically always a Meckel's diverticulum in one or other of its varieties. In addition to intestinal obstruction, the bowel is snared by the band, and also may undergo torsion around its mesenteric axis. These cases are usually very acute. The symptoms are very well known.

Adhesions are nearly always the result of tuberculous peritonitis, previously known to exist, or often entirely unsuspected. These adhesions, which may glue bowel to bowel, may be very complicated or very simple. One not infrequent form is adhesion of a coil of bowel to a caseating tuberculous gland: I have met with two varieties of this.

In one of my cases obstruction was produced by a mass of caseating tuberculous glands in the lower mesentery; these had reached such a size as to form a large palpable mass, and had so stretched the gut over them as to occlude its lumen. The glands were so extensive that removal was out of the question: all I could do was to incise their capsules and curette the contents away. This treatment was efficient, as the boy is now perfectly well.

Royal Society of Medicine.

SECTION FOR THE STUDY OF DISEASE IN CHILDREN.

Provincial Meeting, held at Addenbrooke's Hospital, Cambridge, on July the 8th, 1911.

(*Continued from p.* 366.)

Infantile Spastic Paraplegia.—Mr. C. Searle.—Father, an only child, at the age of 3½ years had a sudden paralysis of the right arm, left leg and right side of face, which came on after a hot day with violent epistaxis suddenly in the night; had difficulty in swallowing and could not talk properly. After fifteen months power gradually returned except in the face. Mother healthy.

One brother, a perfectly healthy child at birth, when aged 1 year and 8 months had a fall on the back of his head, and after that was unable to walk or talk; deficient power in left arm. Knee-jerks exaggerated. Extensor response. Loss of power in the neck. Admitted to Great Ormond Street Hospital for progressive upper neuron degeneration of unknown causation, ? injury. Treated with potassium iodide. Had difficulty in swallowing and finally became totally paralysed. Died aged 2 years and 7 months. Patient was a perfectly healthy and intelligent child until 8 months old. One day had a fit which lasted an hour, and was followed by a paralysis of both arms, legs and back. Control of bladder and rectum perfect. In August and December, 1910, and March, 1911, great difficulty in swallowing and a high temperature. Apparent improvement with potassium iodide. Had "screaming fits" which were getting more frequent, clenched the teeth, became rigid, and passed water after the fit. Knee-jerks exaggerated, ankle clonus and Babinski's sign present. Marked spasticity in the legs, less in the arms. Could sit up. Could not talk but seemed fairly intelligent. Sight good.

Goitre.—Mr. W. H. Bowen.— A girl, aged 16 years, had a very large parenchymatous goitre. The swelling caused no dyspnœa and no difficulty in swallowing but was rapidly increasing in size, so it was proposed that one half should be removed.

Dr. H. B. Roderick showed specimens of the following cases among many others:

(1) **Myeloma of Upper End of Humerus.**—Vertical section of the upper end of the humerus of a child, aged 7 years. The shaft, for a distance of about 3 in., was expanded into a thin-walled cavity, the highest part of which corresponded with the epiphysial line, except at the inner aspect, where a small wedge-shaped area of the normal cancellous bone of the upper end of the diaphysis remained. The interior of the cavity was quite smooth, though here and there the osseous shell bounding it was thinner than elsewhere and translucent. Microscopic sections of one of the chief membraniform septa in the cavity showed it to consist of spindle-celled connective tissue in which

considerable numbers of multinucleated giant-cells occurred. The boy fell eight months previously and complained of having hurt his left shoulder. On examination nothing abnormal was detected. During the following seven months the boy never used the arm quite freely, and always complained of it hurting him if it was suddenly jerked. Another fall, hurting the arm in the same place, brought him again under observation, when the upper third of the arm was found to be enlarged—due, obviously, to bony expansion. A skiagram confirmed the diagnosis of new growth, and amputation was performed. On removing the soft tissues the scalpel broke through a thin shell of bone, from which clear, dark straw-coloured serum flowed.

(2) **Sarcoma of Small Intestine.**—The child was only aged 3 years, and 6 ft. 5 in. of the small intestine were removed owing to the encroachment of the growth on the mesenteric blood-vessels. The growth was a round-celled sarcoma. The child made a good recovery from the operation and for a time gained weight at the rate of 2 lb. a week.

(3) **Sloughing Tonsil; Fatal Hæmorrhage from Internal Carotid.**—From girl, aged 1 year and 5 months. Patient had measles one month previously, followed by a "lump" in the neck of two weeks' duration. Brought into hospital vomiting blood. Shortly after admission she had profuse hæmatemesis and died.

(4) **Ulceration of Internal Jugular Vein.**—From boy, aged 1 year and 8 months. Measles three weeks previously, followed by discharge from ear and enlargement of glands in neck. An abscess in the right side of the neck was opened. Twenty-four hours later there was a sudden profuse hæmorrhage from the wound, which proved fatal.

Dr. J. Aldren Wright showed: (1) **Heart from an Infant aged 6 Months.**—The specimen showed (1) incomplete interventricular septum; (2) a small conus arteriosus terminating in a small pulmonary artery with defective valves: (3) large aorta, communicating directly with the right ventricle. The infant was very cyanosed. Hæmoglobin, 118 per cent. Red blood-corpuscles, 8,460,000. Loud systolic murmur in the pulmonary area.

(2) **Femur and Tibia from a Case of Infantile Scurvy.**—The specimen showed the separation of the periosteum from the shaft of the bones by blood, and a separation through the upper epiphysial line of the femur. The infant was aged 10 months. Had been ill for three months with "rheumatism." Was rickety. Had spongy gums. Hæmorrhage along both upper and lower extremities. Had diarrhœa and died.

Heart showing an Infective Polypoid Thrombus in the Pulmonary Artery, and extending into the Right Ventricle.—Dr. T. R. Whipham.—The specimen showed a large elongated thrombus almost entirely blocking the pulmonary orifice. In the pulmonary artery, about a quarter of an inch above the valves, was a roughened area, to which the thrombus was attached in a recent state. The tricuspid, mitral, and aortic valves showed no lesion. There were no abscesses in the lungs or elsewhere.

The patient was a girl, aged 11½ years, who, during life, presented a loud

churning rumble in the pulmonary area, obliterating both sounds and extending throughout both systole and diastole with a rising and falling cadence. The murmur was typically that described as diagnostic of patent ductus arteriosus. The child was under observation for seven months, and during the last three and a half weeks signs of an infective process were present. The temperature became hectic in type, ranging between the extremes of 96° and 106° F., and numerous rigors occurred. Staphylococci were cultivated from the blood, but injections of serum had no effect.

A Skull from a Case of Idiocy of the Mongolian Type.—Dr. G. S. Haynes.—The child presented all the usual features, and died of broncho-pneumonia. No congenital heart disease or defects of other organs. The child was the ninth of a family of ten. The eldest was a microcephalic idiot and an epileptic. Age at death two years and eight months.

The Portals of Entry in Tuberculosis.—Dr. L. Cobbett.—After a brief historical sketch of the recent aspect of the controversy, Dr. Cobbett proceeded to discuss the various surfaces through which tubercle bacilli might conceivably enter the body. The conjunctiva, the mammary ducts, the urinary and genital tracts he passed over, as, at most, uncommon portals of entry. The main portals of entry were the skin and the mucous membrane lining the alimentary canal and the bronchi. The skin seemed to be seldom the portal for severe and fatal tuberculosis. Lupus, of course, arose as a primary skin affection, and not infrequently the skin was infected with tuberculosis through wounds received at post-mortem examinations of men and animals. In such cases there was usually a lesion at the portal of entry without disease of the nearest lymphatic glands, though tuberculosis of the axillary glands had occurred in some cases and had been observed to follow a wound of the hand which itself showed no evidence of being tuberculous.

The problem was whether the tubercle bacilli which caused phthisis entered through the mucous membrane of some part of the alimentary canal or through that of the bronchial system. This was a practical and not merely an academic question, for on its solution must be based measures of practical hygiene. The really important question was, were we to continue to regard the phthisical patient as the main source of tuberculous infection?

Dr. Cobbett then went on to criticise the work of Calmette and the Lille school in general, on which was mainly based the modern view that phthisis was of intestinal origin.

The feebleness of Calmette's and Guérin's experimental work as a support to their sweeping conclusions had been clearly exposed recently by Sir John McFadyean. The experiments were, indeed, few in number, and revealed no new facts. The one case which lent most support to Calmette's theory, namely, that of a goat which developed extensive and severe lung tuberculosis after being fed with tubercle bacilli, was not beyond criticism. The use of a stomach tube employed by Calmette in feeding experiments was condemned, and seemed to the author rather to provoke the passage of some of the food material into the bronchi than to render it impossible.

The experimental work of Vansteenberghe and Grysez, which formed part of the basis of Calmette's theory, was rejected. Many experimenters, including himself, had failed to confirm it. Only Sir William Whitla and Prof. Symmers had got similar results, and the same source of error seemed to pervade both investigations. Dr. Cobbett believed that they had mistaken the natural anthracosis of the adult guinea-pig bred in towns for the result

of feeding with Indian ink or powdered carbon. He himself had failed to find any trace of anthracosis after feeding country-bred guinea-pigs with Indian ink. Neither Vansteenberghe nor Whitla made any mention of control guinea-pigs.

With regard to the assertion that air-borne bacteria cannot enter the lungs unless there be some malformation, Dr. Cobbett quoted the inhalation experiments made by Hartl and Hermann with *B. prodigiosus*, and by Bartel and Neumann with tubercle bacilli, and his own confirmation of them. If even small quantities of these bacilli be sprayed into the air breathed by guinea-pigs they may be found in the remoter part of the air-passages five minutes later. In his experiments with guinea-pigs inhalation tuberculosis always commenced in the lungs and bronchial glands, deglutition tuberculosis in the intestine and mesenteric glands. Moreover, he had found in making cultures from the various organs of many different kinds of animals that while the other organs were usually sterile, or at most yielded a colony or two, the lungs invariably gave rise to many colonies of moulds, streptothrices, spore-bearing bacilli, and sarcinæ—in fact, just those bacteria commonly got from the air.

In judging the results of feeding experiments on animals, one must not lose sight of the possibility of some of the infective matter getting aspirated into the lungs. This had been shown to be a real source of error by the experimental work of several German observers, including Beitzke. He had himself independently arrived at the same conclusion, for he had found that when rabbits and guinea-pigs were fed with *B. prodigiosus*, in spite of every precaution, when the animals were killed and cultures made from their lungs a few colonies of this micro-organism always appeared on them. The contamination of the lungs with food material was not a gross one, for the test employed was a particularly delicate one, but it was sufficient to throw grave doubts on the intestinal origin of pulmonary tuberculosis following feeding experiments.

Dr. Cobbett then referred to the work recently carried out at Breslau, particularly by Findel, and to that of Rossel Weber and Heuss and others working for the Tuberculosis Committee of the Gesundheitsamt in Berlin, showing that it takes at least a thousand times as many tubercle bacilli to infect an animal by feeding as it does to infect one by inhalation. This he explained on the grounds that the mucous membrane of the intestine, being constantly exposed to swarms of bacteria (compared to which those in the bronchi were a mere nothing), the defensive powers of its lymphoid tissue and lymphatic glands were more highly developed than those of the lungs.

The intact mucous membranes were constantly being penetrated by bacteria of various kinds, and consequently came in for a good deal of daily work. He had found that the mesenteric glands of animals almost constantly contained bacteria. Feeding experiments by Ravenel and by Griffith for the Tuberculosis Commission had shown that tubercle bacilli in dogs might reach the mesenteric glands in a few hours. They seldom, however, got beyond, though some of Griffith's experiments seemed to show that an occasional bacillus might, in exceptional cases, escape through them and reach some distant organ. Griffith himself failed entirely to find them in the chyle of dogs previously fed with them.

The lymphoid tissue in the mucous membranes and the lymphatic glands were placed at all the portals of entry, and were the true guardians. Hence tuberculous lesions were so commonly found in the glands. They indeed might be said to mark the portals of entry of tubercle bacilli. That in

some cases the mucous membrane through which the bacilli had penetrated lymphatic glands might escape and tuberculosis be primary elsewhere he did not actually deny, but he was sceptical, for post-mortem records of such cases were not numerous. Quite lately in a fatal case of caries of the dorsal vertebræ he had found an old calcareous mesenteric gland. In how many cases of apparently primary hip disease and the like would a tuberculous gland be found if carefully looked for?

The relative susceptibility to tuberculosis of various tissues and organs was then discussed. The cause of this was largely anatomical. The mucous membranes of the intestine and bronchi were directly exposed to bacilli; the lymphatic glands were the next to receive them. And after that they must pass through the lungs before they could reach any other organ. But there were also differences in inherent susceptibility due to differences in capacity of various tissues to destroy tubercle bacilli, or to differences in their powers of arresting them, similar to the differences which had been shown to exist in their powers of taking up pigments, such as carmine, introduced into the circulating blood. He thought that the latter was the true explanation, for though differences probably existed in the destructive power of different organs, yet the more destructive organs were probably also the more likely to take up the bacteria. He had been much impressed, when working for the Tuberculosis Commission, by what might be called the influence of dose. Small doses of tubercle bacilli might suffice to infect one animal but not another, but large doses would infect them all alike, the less susceptible as well as the more susceptible individuals. He had observed in the grouse, in the rabbit, and quite recently in the sheep, that intestinal parasites (nematode worms and coccidia), which caused minute lesions in the mucous membrane, opened the door to the entry of intestinal bacteria (especially of *B. coli*) into the liver and other organs. In like manner the frequency with which tuberculosis occurred after measles and other specific fevers was possibly due to lesions in the mucous membrane of the bronchi and intestines which widely opened the portal to tubercle bacilli and admitted them in numbers which there was no resisting.

In the case of the phthisis so prevalent among those following dusty occupations, he suggested that sharp particles of grit might act as minute inoculating needles. In all the dusty occupations much troubled with phthisis, the Cornish and South African miners, and the potters, the dust contained sharp spicules, while among the coal miners, in whose case the dust was not sharp and capable of pricking the mucous membranes, though their lungs became infiltrated with dust, phthisis was no commoner than among other men.

In conclusion, the speaker said that while he had no doubt that tuberculosis was frequently of intestinal origin, especially in children, inhalation was the common mode of infection, not in phthisis only, but in other forms of tuberculosis also, especially in the numerous cases in which the bronchial glands seemed to be the parts first affected. (*Author's abstract.*)

A lengthy discussion ensued, in which the President, Mr. C. Lucas, Mr. A. Whitelocke, Dr. H. D. Rolleston, Dr. T. R. Whipham, and Dr. M. Fletcher took part.

In his reply, Dr. Cobbett expressed the opinion that the bovine type of tubercle bacillus was less virulent for man than the human type; and he made a rough estimate based on the cases investigated by the Royal Commission and by the Gesundheitsamte in Berlin which put the proportion of deaths due to tuberculosis of all kinds which was attributed to the bovine

bacillus at 7 per cent., or roughly 3800 deaths per annum in England and Wales, as compared with 50,000 caused by the human type of bacillus.

Society of Infant Consultations.

A General Meeting of the Society was held on Thursday, July the 13th, at the Marylebone Dispensary, 77, Welbeck Street, at 5 p.m.

Dr. Eric Pritchard explained that the object of the meeting was to ascertain the opinion of members with regard to the proposed scheme of amalgamation with the Department of Schools for Mothers of the National League for Physical Education and Improvement. The new organisation would be called the Association of Infant Consultations and Schools for Mothers, and would have a much wider field of usefulness than under the present conditions. The secretarial duties would in future be carried on by the permanent staff of the League.

The new scheme, which was proposed by Dr. Langmead and seconded by Miss Fitzgerald, was unanimously adopted by the meeting.

A paper was subsequently read on breast-feeding and the value of the test-feed by Dr. Eric Pritchard, Dr. Ronald Carter, and Dr. Pitt.

In this paper a vast number of statistics derived from estimations of breast-feedings conducted at the Marylebone and Kensington Infant Consultations, at the Marylebone Workhouse and the Queen's Hospital for Children were analysed and discussed.

It was shown that these figures did not in the least agree with statistics furnished by foreign observers, on which our ideas with regard to the requirements of artificial feeding were chiefly based. The advantages of the test-feed for the purposes of diagnosis and treatment were illustrated and emphasised.

It was pointed out that breast-fed infants subsisting on an average of $6\frac{1}{3}$ oz. of milk per diem made better progress than those who were receiving 25 oz. per diem, and also gained more rapidly in weight.

The paper was discussed by Dr. Langmead, Dr. Robertson, Dr. Lane-Claypon, Mrs. Greenwood, Miss Fitzgerald, and other members of the Society.

Philadelphia Pediatric Society.

June the 13th, 1911, J. Torrance Rugh, M.D., President.

Early Operation for Psoas Abscess.—Dr. James K. Young showed a boy, aged 6 years, who developed tuberculosis of the spine with psoas abscess, which was recognised by flexion on the opposite side of the thigh,

high temperature, leucocytosis, and a tender point in the loin of the affected side. The condition was verified by the X-ray and tuberculin test. Dr. Young performed the Treves' operation, making a lumbar incision, with the centre over the transverse process of the lumbar vertebræ, dissecting down to the psoas muscle and evacuating the abscess. He used a blunt instrument to open the abscess, kept up drainage for a few days only, and recovery rapidly followed. A splint brace was then to be worn for a year or so.

New Splint for Hip Disease.—Dr. Young also showed a boy, aged 10 years, who had marked symptoms of hip disease two years ago. Extension was applied for two weeks while the special brace was being made. This was applied for one year, and then a convalescent hip splint was used. He had now entirely recovered. The special splint consisted of a body, thigh, leg and foot portion, all made of hard leather, over a cast taken from the patient standing with the limb slightly abducted. The cast extended from the axilla to the toes. The body portions made over the cast were connected by a bar of steel passing down the back of the body and limb. Opposite the calf the extension was provided and the leather portions were secured with lacings. Two perinæal straps were used and the patient walked with a high shoe and crutches. The splint was applied in the recumbent position, the brace being half an inch longer than the limb. The patient was laid into the brace, the body portion was laced, the perinæal straps were applied, the foot was pulled down into the foot-piece so as to make extension, and was secured by lacing; later the thigh and cap portions were also laced. The splint combined traction and fixation, was very light and comfortable, and patients made more rapid recovery with its use than by any other form of apparatus.

Dr. Rugh said that recovery with function was the result desired in such cases. If they were seen early and the diagnosis was made early, good results were possible. But many cases advanced without recognition by the attending physician, abscess occurred, and recovery with function became impossible. Yet Dr. Rugh recalled a case of hip-joint disease in which curetting and removal of the head of the bone were done, but three quarters of normal range of motion resulted.

Dr. Young then demonstrated the splint on and off the patient.

Microsomia.—Drs. Charles A. Fife and Borden S. Veeder showed a girl, aged $6\frac{1}{2}$ years, who was normal at birth, and grew until eighteen months old, but had not grown any since. Alcoholism in the mother; parents and other children of normal size. Table food was begun at eighteen months of age. She had several attacks of diarrhœa during her second summer, also pertussis and measles. Her total length was $80\frac{1}{2}$ cm.; length, from acromium to spine of ilium, 22 cm.; from anterior superior spine to external condyle of femur, $21\frac{1}{2}$ cm.; from external condyle to external malleolus, $14\frac{1}{2}$ cm.; length of feet, 11 cm.; length from acromium to head of radius, 13 cm.; greatest circumference of head, $44\frac{1}{2}$ cm.; circumference of chest, 45 cm.; circumference of abdomen at umbilicus, 45 cm. There were no signs of cretinism, rachitis, or tuberculosis. Heart and lungs negative; abdomen slightly distended, apparently from muscular weakness; teeth normal. X-ray showed retarded bony development, the wrists showing but four centres of ossification, and the bony framework proportional to the rest of the body. Urine and blood examination negative. She could walk, talk, and was of good mentality. Was placed upon nitrogenous balance, and

the urine examined for a week. The nitrogen partition was about normal. Creatinin elimination was ·0079 grm. per kilo.

Rachitis.—Drs. Fife and Veeder showed an Italian baby, aged 18 months, with marked epiphysial enlargements. X ray showed very little calcification at the ends of the bones, and the shafts of the bones were less than a third of the thickness of the epiphyses. The musculature was exceedingly flabby, and the child did not use feet or legs. The pelvic outlet was narrowed, which, with some bowing and shortening of the femora, produced a condition simulating congenital dislocation of the hip.

Congenital Heart Disease.—Drs. Fife and Veeder also showed a girl, aged 2 years, admitted to St. Christopher's Hospital for Children for dyspnœa and lassitude, conditions which had not been present since admission. Mother had tuberculosis. Birth was normal, and child was not a blue baby. Her only illness had been pertussis. She was well nourished; no cyanosis; fingers somewhat suggested clubbing. Heart enlarged to percussion, from second interspace to left nipple line, to 2 cm. to right of sternum. There was a faint thrill, rather diffuse over lower part of præcordium, most marked in the fourth interspace at left border of sternum. A loud-rasping murmur, systolic in time, replaced the first sound over the entire heart, with point of maximum intensity over second and third interspaces to left of sternum. It was transmitted through the entire chest, and could be heard in the vessels of the neck. A faint second sound at the end of the murmur was heard at the apex, and at times over the pulmonic area. The liver extended 1 cm. below the costal margin. She had been under observation for some time; neither rest nor exercise seemed to exert any influence on the physical signs. There had been no evidences of loss of compensation. X rays showed enlargement of the right side of the heart, with probably slight enlargement of the left ventricle. The left auricle was not enlarged. A tentative diagnosis of defect in the intra-ventricular septum, with narrowing of the pulmonary orifice, had been made.

Enlarged Thymus Gland.—Drs. H. S. Bachman and B. S. Veeder showed a Yiddish infant, aged 6 months, with enlarged thymus. There was a distinct stridor present, most marked on expiration, increased when the head was drawn backward. X-rays plate showed a shadow corresponding to the area of dulness obtained by percussion over the enlarged gland. The baby was to be treated by X rays.

Dr. Fife called attention to the great epiphysial enlargement in the case of rachitis. He believed that, in the case of congenital heart disease, lesions of all the valves could be eliminated, leaving the most probable diagnosis a deficiency of the intra-ventricular septum, with possibly constriction of the pulmonary artery.

Dr. Joseph Sailor said the diagnosis of congenital heart disease was often very difficult. He referred to a case in which there was a loud murmur, powerful thrill over the pulmonic cartilage with accentuation of the second pulmonic sound, but at autopsy the only lesion found was hypertrophy of the left ventricle and chronic kidney disease. The X rays were not decisive in determining enlargement of the right or left ventricle, especially in children. In the present case he heard clearly the murmur transmitted to the vessels of the neck and not through the solid tissue. That would indicate aortic disease. He considered it rare to have defective

septum in pulmonary stenosis without cyanosis and polycythæmia was often present. The pallor in the present case was also suggestive of an aortic lesion.

Dr. Veeder added that the blood-count in this case was simply that of slight anæmia. While there might be a chance of post-natal infection in the child, the enlargement of the heart, without any signs of loss of compensation, proved it to be congenital. He thought that some narrowing of the pulmonic orifice must be present.

Ununited Fracture of Lower Third of Tibia of Seven Years' Standing.—Dr. Rugh showed a boy, aged 10 years, whose left leg was broken seven years ago, treated by splints, plaster and braces without success. Wiring the bones after a year's time was also unsuccessful. A year later silver plates were used to keep the bone ends in apposition, but extensive suppuration occurred and no results were obtained. When Dr. Rugh operated two months ago there was exaggerated forward bending of the tibia at the point of fracture, with short tendo Achillis. This tendon was cut subcutaneously and the leg forcibly straightened. The site of the fracture was then exposed, the bone ends cleaned, and a piece of bone and periosteum, ¾ in. wide and 2 in. long, was cut from the lower end of the upper fragment. This was slipped downward across the break, and sewed to a slit in the periosteum of the lower fragment and to the lower end of the upper fragment. The leg was placed in plaster-of-Paris, and union occurred by first intention. There was now a slight degree of fixation to be elicited, and the indications were that a good result would be obtained. This was a modification of Murphy's method, in which a groove was chiselled in the lower fragment for the transplanted piece. The case was one of two upon which Dr. Rugh had operated within two weeks of each other, with favourable prognosis in each case.

Dr. Young asked what had been done with the fibula, as this bone usually caused trouble in such cases by producing deformity from its more rapid growth. These cases were interesting from the fact that many of them come to the orthopædic surgeon after having passed through the hands of the general surgeon. As a rule orthopædic surgeons did not desire to treat fractures, since their work was largely with chronic deformities, and they were better qualified to treat these cases after they had existed for some time.

Dr. Rugh added that both bones had been broken in this case, and he had only freshened up the edges of the broken fibula.

Intussusception.—Dr. Harry A. Schatz, by invitation, showed an infant upon whom operation had been performed at eight months for intussusception. The attack began with vomiting of everything ingested, severe abdominal pain in paroxysms, frequent bloody stools containing mucus, but no fæcal matter, scanty urination and shock. The characteristic sausage-shaped tumour was felt in the left iliac fossa, and extending upward to the hypochondriac region. Injection of water under pressure *per rectum*, with the child inverted, failed to relieve the condition. Dr. A. C. Wood operated sixty-five hours after the onset. The lower part of the ileum, cæcum and appendix and the first three inches of the ascending colon constituted the invaginated portion. The bowel was delivered by compressing the large intestine below the site of the tumour. Recovery was rapid and uneventful.

Abstracts from Current Literature.

Medicine.

The importance of radiology in the examination of cicatricial stricture of the œsophagus in children (*'Jahrb. f. Kinderheil...'* 1911, LXXIII, *p.* 704). **H. Flesch** and **I. Péteri** find the value of this method of examination is as follows: (1) A complete picture of the whole œsophagus is obtained, so that the localisation of the stricture in relationship to the corresponding vertebral body, the degree, the length, and existence of single or multiple stenosis, are made manifest, and also the presence and extent of dilatation above the stricture. (2) If stenoses are present, the rays permit the examiner to find out whether after systematic treatment the œsophagus has regained its functional activity completely and allows of free passage of food. (3) The method can be employed within the first six weeks after swallowing of caustics, and hence at a time when passage of a sound is inadvisable. (4) It is easy to perform and is completely free from danger. F. R. B. ATKINSON.

Myiasis gastrica (*'Riv. di Clin. Pediat.,'* 1911, VIII, *p.* 101).—**M. Condorelli Francaviglia** reports the case of a girl, aged 11 years, living in unhealthy surroundings near a stable and dung-heap, who had repeated attacks of gastric pain and vomiting. After treatment she vomited about 200 larvæ of *Calliphora vomitoria* and *Eristalis tenax*. These, having found their way into the stomach with the food, are protected by their chitinous envelope, resist the action of the gastric juice, and remain alive a considerable time—a month in the case related. The larvæ fix themselves by the buccal apparatus to the gastric mucous membrane, and cause erosions and small wounds which result in bleeding, more or less intense gastralgia, nausea, vomiting, and even attacks of reflex convulsions. The traumatism and disturbance of digestion end in a true gastritis, which is, however, cured as soon as the larvæ are expelled by means of benzonaphthol or naphthaline. VINCENT DICKINSON.

Foreign body in the intestine (*'Journ. de Méd. de Paris,'* 1911, XXXI, *p.* 500).—**Giron** narrates the history of a child, aged 10 years, who passed by the bowel a body of the size and shape of a small pigeon's egg weighing about 1·30 gr. Incomplete analysis revealed the composition of the coprolith as follows: Lime, small amount of magnesia, phosphates and organic matter; no cholesterin or pigment. F. R. B. ATKINSON.

Œdema occurring in the course of disease of the gastro-intestinal tract in infants (*'Practitioner,'* 1911, I, *p.* 686).—**Hugh T. Ashby** finds this symptom fairly common. It generally starts from a week to a fortnight after the diarrhœa has ceased. The infants are usually bottle-fed in a wrong manner, and the œdema mostly appears about the first year. The urine is scanty and often contains no albumen. Post-mortem examination reveals no changes in the kidneys, and in a few cases, cloudy swelling. The symptom is a serious one, but it is by no means fatal. Treatment consists in suitable feeding. The food should contain a high percentage of proteids and a low percentage of carbohydrates and fat. Citrate of potash is the best diuretic. F. R. B. ATKINSON.

Melæna neonatorum (*'Austral. Med. Gaz.,'* 1911, xxx, *p.* 139).—**G. H. Evans** describes a case in which twenty-four hours after birth partly digested blood was vomited, and sixteen hours after this a motion of dark blood was passed. During the next twenty-four hours several motions of the same character were evacuated. The author ordered 1 gr. of $CaCl_2$ every two hours and teaspoonful doses of alum whey (℥j in Oj) frequently. As the child's condition became more serious the drug was increased to two doses of 1 gr. each in three hours. The bleeding ceased and the child recovered. F. R. B. Atkinson.

The clinical aspects of acute appendicitis in children (*'Practitioner,'* 1911, II, *p.* 61).—**H. Collinson** finds that appendicitis is the commonest and most important surgical disease of the abdomen met with in childhood, and a large number of cases occur between five and fifteen years of age; under five its frequency is much less. The infantile appendix is comparatively larger than in the adult, its coats more delicate and lymphoid tissue more abundant. The commonest cause is careless feeding. A history of recurrent attacks of stomach-ache should excite the suspicion of appendicitis. Nausea and vomiting may be slight and abdominal rigidity often badly marked. In appendicitis, as a rule, fever appears some time after the initial pain, and cases in which pyrexia is present some time before the pain are probably not cases of appendicitis. A sudden fall of temperature after an initial rise is often a sign of gravity. The author warns against the administration of purgatives in every case of what seems to be a case of gastro-enteritis, and such treatment often leads to dangerous consequences if the case should prove to be one of appendicitis. The prognosis in children under ten years of age, apart from early operation, is bad; if operation is undertaken early, the outlook above five years of age is good, below that age always grave. The author recommends operation at once in the acute stage, *i. e.* within the first forty-eight hours, and the same applies to cases between the second and fifth days. After this time operation is not so urgent, and it may be advisable to wait in the hope that a quiescent period may occur when it should be undertaken without delay. F. R. B. Atkinson.

Pin-worms and caraway seed in infantile appendix (*'New York Med. Journ.,'* 1911, I, *p.* 529).—**I. Kornblüh** records a case in a male child, aged 18 months, who had shown no signs of appendicitis. He had been fed on rye bread with caraway seed. During an operation for right inguinal hernia it was thought advisable to remove the appendix, which was 4 in. long. Externally it was normal, but on being opened it was found to contain eight living pinworms and one caraway seed, the latter imbedded in a slight inflammatory exudate. J. D. Rolleston.

Tuberculous peritonitis with the syndrome of appendicitis (*'Arch. de Méd. des Enf.,'* 1911, XIV, *p.* 529). **A. Galliot** narrates a case in a boy, aged 6 years, of the above disease, the symptoms of which exactly simulated appendicitis. The appendix was removed and was found quite healthy both macroscopically and microscopically. The author refers to other cases in the literature. F. R. B. Atkinson.

Icterus neonatorum and umbilical suppuration (*'Wien. klin. Rundschau,' Nos.* 44 to 51, *October 30 to December* 18, 1910).—**Stumpf** reviews the various theories that have been advanced as to infantile jaundice.

After an exhaustive analysis of his own observations upon forty-eight infants with jaundice and fifty-six without jaundice, he concludes that icterus neonatorum does not depend upon an infection spreading from the navel. Its frequency is not diminished by a treatment of the cord and navel that practically excludes such infection. It occurs when there is no apparent umbilical lesion. Changes in weight and temperature are quite unaffected by the presence of jaundice. Icterus neonatorum and lesions of the umbilicus are equally disposed to by dragging or rough handling of the cord both during and after birth, more especially when the cord is ready to fall off. The cord should therefore be treated with all possible consideration. After being cut at $1\frac{1}{2}$ cm. it should be dusted with a drying powder, the best for this purpose being sterilised plaster of-Paris. M. D. Eder.

Infantile hepatic abscess; operation; recovery (*'Indian Med. Gaz.,'* 1911, xlvi, *p.* 137).—**W. J. Niblock** removed eighteen ounces of pus from a liver abscess in a Hindu boy, aged 11 months, with recovery. The age is remarkable. F. R. B. Atkinson.

Infantile biliary cirrhosis (*'Indian Med. Gaz.,'* 1911, xlvi, *p.* 140).—**Bhup Singh** describes four typical cases in children under two years of age, all of which died. Three cases were nursed by their own mothers, and the fourth was brought up on cow's milk. F. R. B. Atkinson.

Angio-sarcoma of the liver in an infant (*'Journ. Amer. Med. Assoc.,'* 1911, i, *p.* 873).—**Bondy** reports the case of a child, who, when three weeks old, was noticed to have a protuberant abdomen owing to a mass in the upper part. Laparotomy showed that the mass was an enormously enlarged liver, filling three quarters of the abdominal cavity. A small portion was removed for microscopical examination, and proved to be angio-sarcoma. The child died some three months later. The extremities became œdematous, but at no time was there ascites or jaundice. Diarrhœa finally set in, and death occurred from exhaustion. T. R. Whipham.

Hæmophilia (*'Deutsch. Arch. f. Klin. Med.,' vol.* xcix, *Nos.* 5, 6. *Abst. 'Interstate Med. Journ.'*).—From the investigation of a considerable number of cases of hæmophilia **Sahli** has come to the conclusion that the total number of white blood-corpuscles is usually diminished, but as a rule a moderate lymphocytosis is present. The percentage of eosinophiles and mast-cells is strikingly high and the blood-platelets are increased in number. The coagulability of the blood is much diminished, but can be increased by the addition of normal blood-serum or of washed red corpuscles. These observations support the theory that hæmophilia is a disease of the cellular elements of the blood, which probably contains sufficient fibrin ferment but too little thrombokinase. Therapeutically the author advises repeated withdrawals of small quantities of blood and the injection of fresh, normal human serum. The former stimulates the bone-marrow to the formation of fresh corpuscles, and the latter to increased production of thrombokinase.
T. R. Whipham.

Further cases of Leishman's anæmia (*'La Pediatria,'* 1910, xviii, *p.* 832).—**G. di Cristina** reports eleven new cases observed in Palermo. They prove that this condition has long existed in this locality, where it flourishes almost exclusively in the children of peasants in the months of

May and June. Generally mononuclears and sometimes neutrophile polynuclears predominate. A few myelocytes may be met with. The red corpuscles are usually diminished in number so that there may be intense oligocythæmia. There is also more or less oligochromæmia, even as much as is met with in pernicious anæmia. The blood condition varies with the stage of the disease. Fever is irregular in type and duration; generally it is cyclic or periodic. VINCENT DICKINSON.

The pathological anatomy of Leishman's anæmia (*'La Pediat.,'* 1911, XIX, *p.* 209).—**G. di Cristina** and **S. Cannata** give a full report of the autopsies in two fatal cases. Some of the changes described were directly connected with infection by Leishman's parasite, others were secondary and dependent on superadded complications. The first affected the liver, spleen, bone-marrow and lymphatic glands, the latter the lungs, kidneys, and perhaps the intestines. The changes in the liver, spleen, bone-marrow and lymphatic glands, concerned the endothelium, in which there was proliferation followed by degenerative, and sometimes necrotic and sclerotic changes. In all cases the authors found marked changes in the large intestine, lesions undescribed by others. Pianese attributes an important signification to the absence of intestinal lesions in deciding the question of the identity of the Indian kala-agar with the Italian Leishmaniosis, and, as is natural, a negative result in Pianese's cases and a positive in the author's takes away some support from this question, which has now no *raison d'être*. The changes in the kidneys and lungs can only be considered complications, and are of no importance as they are not constant. Leishman's parasites were found in the following organs: Liver, spleen, bone-marrow, mesenteric lymphatic glands and follicles of the large intestine. They were always intra-cellular and of various sizes in the same organ. Their size was therefore of no value in determining the age of the infection in each organ. VINCENT DICKINSON.

Infectious myelocytosis (*'Jahrb. f. Kinderheilk.,'* 1911, LXXIII, *p.* 586).—**P. Jungmann** and **P. Grosser** describe a case of a child, aged 3 years, in whom after a severe enteritis the blood showed such an extraordinarily large number of myelocytes that the suspicion of a myeloid leukæmia was aroused, but on post-mortem examination the presence of this latter disease was negatived. As a result of their examination the authors conclude that, especially in childhood, an infectious disease can produce injury to the blood-forming organs, which damage can be limited to the myeloid system and result in the presence of enormous numbers of unformed medullary cells in the blood. They also found that the number of myeloid cells fell and increased with the number of leucocytes. F. R. B. ATKINSON.

A case of pseudo-leukæmic anæmia of infancy (von Jaksch) (*'Journ. Amer. Med. Assoc.,'* 1910, II, *p.* 1097).—**Elterich** reports the clinical history and post-mortem findings in a case of von Jaksch's anæmia. The patient was a male aged 13 months, and was one of twins, the other having died from diarrhœa. Signs of rickets were present and purpuric spots were visible in various parts of the body and legs. The lymphatic glands were enlarged, as was the liver, and the spleen was enormous. The blood showed 2,500,000 red corpuscles, 27,500 white, and hæmoglobin 45 per cent., the differential count being—neutrophiles 6·5 per cent.: lymphocytes—small 61, large 18·63: transitionals 1·47: eosinophils 0·28: myelocytes—

neutrophile and eosinophile 1·18 each; normoblasts 9·76. The red cells also showed poikilocytosis and polychromatophilia. The child died from broncho-pneumonia, gastro-intestinal indigestion and nephritis. At the post-mortem the spleen weighed 5 oz. 15 gr., and was tough. The capsule and trabeculæ were thickened and the follicles completely obliterated (microscopically). The pulp was replaced in places by large areas of fibrous tissue and the vessels were thickened; many of the lymph-spaces were dilated. The pulp itself consisted of cells of various sizes with scanty protoplasm, many of the larger ones having eosinophilic granulations. The liver weighed 11 oz. ¾ drm., and was of a yellowish-red colour. It was infiltrated with fibrous tissue and the cells were degenerated. In the portal spaces the connective tissue and the vessels were thickened. The kidneys showed parenchymatous degeneration and hæmorrhages. T. R. Whipham.

Infantile scurvy (*'L'Echo méd. du Nord,'* 1911, xv, *p.* 66).—**Deléarde** relates two cases of this disease which followed the prolonged use of butter-milk and humanised milk. The first infant, aged 9 months, had been fed entirely on butter-milk; it was anæmic, and the lower limbs were motionless. The gums were normal, as there were no teeth, and there was no subperiosteal hæmorrhages, but the other signs were plain enough, and all disappeared after the diet was changed. The second case was an infant, aged 11 months, which had been fed entirely on humanised milk, the symptoms were similar to the first, and the effect of treatment was the same. The author lays stress upon the difference between this pseudo-paralysis and that of rickets, which comes on at a later age insidiously and is not benefitted by diet alone.
J. Porter Parkinson.

Purpura fulminans (*'Arch. de méd. des Enf.,'* 1911, xiv, *p.* 610).—**E. Weill** and **G. Mouriquand.**—A healthy baby, aged 6 months, breast fed, which had been suffering from slight intestinal disturbance for the last ten days, suddenly developed an infection characterised by fever, extreme tachycardia, diarrhœa and an upward rolling of the eyeballs. About eight hours after the onset two punctiform purpuric spots appeared on the abdomen. The eruption increased with extraordinary rapidity, so that in two hours the child was literally covered with large ecchymoses. Death took place fifteen hours after the onset and six and a half hours from the first appearance of purpura. The two brothers and sisters had had mumps thirteen days previously, but there was no evidence of that disease in the present case. No necropsy. J. D. Rolleston.

Purpura with cerebral hæmorrhage (*'Deutsch. med. Wochens.,'* 1911, xxxvii, *p.* 307).—**F. Schmey.**—The patient was a well-developed boy, aged 8 years, who had had scarlet fever two years previously, and had enlarged cervical glands, probably tuberculous. He was brought to Schmey on October 10, with a history of bleeding from the gums for a few days. There was marked lassitude, but no pain in the joints nor pyrexia. On the 15th hæmatemesis occurred, and on the 15th purpura appeared on the body. On the 18th coma developed. Temperature 103·2° F. Death took place the same day. No necropsy. J. D. Rolleston.

Abdominal symptoms in purpura (*'Thesès de Paris,'* 1910–11, *No.* 241).—**A. Lavallée.**—This thesis contains the histories of nineteen cases, all but two of which occurred in children. The symptoms may simulate

different affections, especially appendicitis, intestinal obstruction, perforative peritonitis and intussusception. Many of these diseases, especially intussusception, may co-exist with purpura. It is often difficult to decide when surgical intervention is required. Two of Lavallée's personal cases occurred in boys, aged 7 and 11 years, in whom recovery occurred without operation.

J. D. Rolleston.

Nephritis as a complication of rheumatic purpura (*'L'Echo méd. du Nord,'* 1911, xv, *p.* 1).—**Deléarde** and **Monnier** relate two cases of rheumatic purpura followed by nephritis, with blood-corpuscles, blood-casts and albumin in the urine, accompanied by considerable anæmia. Both cases went on to chronic nephritis. Three forms of post-purpuric nephritis have been described by Oddo and Helner: A temporary form, rapidly disappearing; a second, subacute form, with a large white kidney, generally terminating in death, but sometimes disappearing; a third form with hæmaturia and epithelial casts, leading to chronic nephritis. The treatment is the same as that of other nephrites.

J. Porter Parkinson.

Physiological albuminuria (*'The Canada Lancet,'* 1911, xliv, *p.* 669).—**G. Chambers** in the course of an article speaks of it as occurring in children and young adults. He says that the vertical posture is an important, if not an essential feature, the excretion disappearing on lying down. The amount of albumen reaches its maximum in the early afternoon and tends to disappear in the evening. The quantity of urine is, as a rule, less during the day than at night, but the sediment varies in the opposite direction. The proteids present are nucleo-albumin, which may be present alone. In other cases serum-albumin and serum-globulin are present in addition. According to the author the presence of a few hyaline casts does not necessarily mean that the albuminuria is due to organic disease. Crystals of calcium oxalate are almost invariably present, and some suggest that it has some relation to the albumin. He sums up the diagnosis as follows: Age is usually under twenty-five. The albuminuria is only present in the vertical posture and may intermit for weeks or months. Nucleo-albumin may be present alone, and casts are usually absent, though their presence does not exclude orthostatic albuminuria. There are no cardio-vascular changes, but lordosis is sometimes present, and its correction by a splint may cause the albuminuria to disappear.

J. Porter Parkinson.

Coli-uria (*'Practitioner,'* 1910, ii, *p.* 347).—**H. Moreland McCrea** points out that year by year this affection commands more attention. The disease is most common in the first eighteen months of life and proportionately more severe at this period. Females suffer more frequently than males, and pregnancy predisposes towards coli-uria. There is always a history of constipation. Infection may take place through three channels. There may be an ascending infection in which infection from without occurs through the meatus; the infection may be transparietal by direct extension from neighbouring organs; infection may be by the blood-stream—descending infection. The cases are classified as follows: (1) There may be simple bacilluria; (2) this may give rise to a cystitis; (3) it may be further advanced, and we find as well a pyelitis; (4) and lastly, the kidney itself may be infected—pyelonephritis. The symptoms depend largely on the variety of the disease met with. In simple bacilluria there are no severe general symptoms. The urine is quite characteristic. It is usually lighter in colour

than one would expect from the specific gravity, which varies from 1010 to 1020. It may be clear on passing, but on standing shows a cloudiness as if one "had blown smoke into it." This smoky appearance is quite characteristic. The urine is markedly acid, and resists alkaline treatment. In babies it stains the napkins a brownish-yellow colour. It may contain traces of albumin. On centrifugalising this urine and staining with methylene-blue the bacilli are easily demonstrated. In more severe cases, where, for instance there is cystitis, pyelitis, etc., marked general symptoms are usually evident. The urine generally contains a considerable quantity of pus, while blood-cells, casts, either hyaline or granular, and caudal cells may be found. There are two lines of treatment—drug therapy and vaccine therapy, which may be used singly or in combination. In prescribing drugs the main objects in view are to render the urine alkaline and at the same time to encourage a copious flow from the kidney. Potassium citrate or potassium acetate are the two best drugs to render the urine alkaline. Children may be given five grains of each four-hourly, and this may be increased by twenty grains a day until the urine becomes and remains alkaline. The drawback to large doses is that diarrhœa may be caused, which tends towards a greater concentration of the urine. The addition of urotropin (one grain in a child one year old) to the alkaline mixture is most useful. If cases do not respond to drug treatment, vaccine treatment may be tried. The vaccines must be autogenous. Three millions is a suitable initial dose for a child one year old and twenty-five millions for an adult. The dose may be repeated in two days' time, and then the interval gradually extended according to the progress of the patient. Histories of four cases (of which three are children) are given.

J. Allan.

Colon bacilluria in a twelve-year-old girl (*'New York. Med. Journ.,'* 1911, I, *p.* 465).—**J. Pedersen** records a case. Four years ago attacks of dull pain in the right loin were associated with gastro-intestinal disturbance. On June 30, 1909, pain over the right kidney, and urethro-vesical pain at the end of micturition began, associated on one occasion with slight hæmaturia. The urine contained much albumin and many pus cells. Five days later, after a long journey, there was an accession of pain, and the urine was thick, "mahogany-coloured," but cleared up in a few days. The attacks recurred, and were accompanied by fever, nausea and vomiting, and increased in frequency. When examined on October 19, 1909, she was obviously ill. Palpation of the abdomen revealed nothing. Both ureters were catheterised for thirty minutes. The left kidney yielded 12 c.c. of amber-coloured, offensive urine containing a trace of albumin and a small amount of blood; the right yielded 15 c.c. of very pale and offensive urine. Albumin was present, and the sediment contained many pus-cells and a few blood-cells and casts. Both kidneys were delivering numerous *B. coli*. Following careful increase in diet, attention to the bowels, and the administration of formalin urinary antiseptics, she had had no return of her symptoms.

Frederick Langmead.

Acute nephritis after impetiginous eruptions (*'Monatsschr. f. Kinderheilk.,'* 1911, X, *p.* 139).—**L. Kaumheimer.**—Impetiginous eruptions play an important part in the ætiology of acute nephritis in children. Among 223 cases presenting these eruptions, nephritis occurred in twenty-one. Infants are almost completely immune, and adults are probably much

more rarely affected than children. Probably the nephritis is mainly caused by bacterial toxins due to secondary pyodermia. The prognosis is favourable in the great majority of cases. J. D. Rolleston.

Pneumococcal nephritis in children (*'Thesès de Paris,'* 1910–11, *No.* 394).—**V. Schmarine.**—The thesis contains the histories of twenty-eight cases, one of which is original. The writer distinguishes three varieties of pneumococcal nephritis: (1) Albuminuria in the course of pneumonia, which is a mere episode in an infectious disease without any special gravity. (2) A severe form characterised by the usual symptoms of acute nephritis. In the great majority of cases the pulmonary lesion is a broncho-pneumonia. This is the most frequent variety, since twenty-two of the twenty-eight cases were fatal. (3) A mild form affecting older children and associated with lobar pneumonia. Anatomically pneumococcal nephritis is characterised by lesions of the renal parenchyma, the convoluted tubules being principally affected. The presence of the pneumococcus in the kidney is easily demonstrated. J. D. Rolleston.

Paroxysmal hæmoglobinuria (*'Jahrb. f. Kinderheilk.,'* 1911, lxxiii, *p.* 131).—**Max Brückner** had the opportunity of examining the blood of a boy suffering from the above disease, and of submitting it to various experiments with the object of finding out the changes in the blood brought on by cold. He finds that the blood of a patient suffering from hæmoglobinuria undergoes hæmolysis if it is first cooled and then warmed, but not if it is only warmed or cooled, or if the serum or blood-corpuscles are separately cooled and then after warming mixed together. He believes the serum of the hæmoglobinuric patient contains a substance which acts on the blood-corpuscles in the presence of cold. If the serum is heated to 55° this influence on the red blood-corpuscles is absent, but can be produced if the serum of a healthy person is added. Since the serum of a healthy person has alone no influence on the blood-corpuscles of the hæmoglobinuric patient, he believes that two substances participate in the condition of hæmoglobinuria, one which only unites itself with the blood-corpuscles in the presence of cold, and another which is found in every serum but is destroyed by heat. The union of the former substance with the blood-corpuscles in the presence of cold can be again disconnected by heat. The blood of hæmoglobinuric patients does not at all times undergo hæmolysis. F. R. B. Atkinson.

Lumbar puncture, morphia and atropine in acute uræmia (*'Zentralbl. f. Kinderheilk.,'* 1911, xvi, *p.* 169).—**Hermann B. Sheffield** reports a case in a girl, aged 9 years, of uræmic convulsions two weeks after apparent cure of scarlet fever. He performed lumbar puncture, withdrawing 80 c.c. of cerebro-spinal fluid, and injected 0·004 morphine and 0·0001 atropine. He finds that subcutaneous injection of morphia increases the value of lumbar puncture. Ten minutes after the operation the girl obtained eight hours' quiet sleep and awoke free from amaurosis and headache, from which she had previously suffered. The convulsions ceased and the child made a complete recovery. F. R. B. Atkinson.

Some acute bronchial affections in young children (*'Clin. Journ.,'* 1911, xxxviii, *p.* 12).—**T. D. Lister** describes the causes of these affections, drawing attention to bronchitis in children being caused in some cases by wrong feeding and coddling, and records an interesting case of pneumococcic

pneumonia successfully treated by a ten-million injection of the commercial pneumococcal vaccine. The author finds the steam-kettle of value when the sounds are dry and wheezing, but discards it if the sounds are moist.

F. R. B. Atkinson.

Chronic membranous bronchitis (*'Jahrb. f. Kinderheilk.,'* 1911, lxxiii, *p.* 225).—**Schneider** showed a boy, aged 6 years, who for four years had had an enlarged liver, emphysema, and asthmatic attacks. For eleven months he had been expectorating branching casts. On admission to hospital the child had paroxysmal cough and severe dyspnœa. There were extensive bronchitis of both lungs and infiltration of the right lower lobe. Temperature normal. During his stay in hospital he expectorated numerous bronchial casts, one 13 cm. long. Improvement followed lime-water inhalations and potassium iodide, and in a month no more casts were brought up. Examination of the casts showed no diphtheria bacilli or other organisms. The sputum contained various bacteria, asthma crystals, and Curschmann's spirals. The blood showed 12·5 per cent. eosinophilia. The chronic form of pseudo-membranous bronchitis is very rare in children. Barely twenty cases have been published. The ætiology is unknown, the prognosis unfavourable, and the treatment symptomatic. J. D. Rolleston.

Empyema in children (*'Zentralbl. f. Kinderheilk.,'* 1910, xv, *p.* 504).—**Oerom** read a paper based on thirty-seven cases at the Danish Pædiatric Society. Suggestive of empyema were (1) signs of exudation in a child under six years. (2) Increased pulse frequency in spite of a crisis or a normal temperature. (3) Increased excretion of indican without intestinal disturbance or tuberculosis. (4) The general condition (sweating, emaciation, pallor, shortness of breath and short cough). A normal temperature, negative puncture, or serous fluid did not exclude empyema. The prognosis depended upon the age, ætiology, and complications. Eight of nine patients under two years died; the youngest was eight weeks old. Of twenty-eight patients over two years five died, three of whom were moribund on admission. Six were tuberculous; all died. Pneumococci were found in most of the rest. In two cases there was spontaneous absorption. In six aspiration alone was performed at first, but all required operation later. Apart from the tuberculous cases pleurotomy was performed in thirteen cases, with three deaths, and resection in thirteen cases, with two deaths. Only one of the fatal cases was more than two years old. J. D. Rolleston.

Lobar pneumonia of Micrococcus catarrhalis and Bacillus coli origin (*'Med. Record,'* 1911, i, *p.* 180).—**F. S. Meara** and **Walter L. Miles** recorded these cases. The first, a boy, aged 14 years, was admitted to the hospital with joint pains and sore throat. The next day the temperature rose to 105° F. and signs of consolidation of the left lung developed. On the ninth day the right upper lobe became solid, and on the twelfth the right middle and lower lobes. Later the left lung, which had resolved, became solid again. Leucocyte count, 48,000. The blood-culture was negative. The sputum yielded a growth of pure *Micrococcus catarrhalis*. Eventually the boy recovered, with well-marked pleural thickening at the base of the left lung. The second case was that of a man, aged 35 years. He complained of cough and prostration. The temperature was 102·8° F. and pulse-rate 80, and remained slow during his whole illness. Respirations were from 24 to 28. Three days after admission he developed consolidation of the

right lowest lobe. Nine days later Klebs-Loeffler bacilli were found in the throat. He then developed erysipelas. The leucocyte count was from 21,000 to 23,000. After three weeks in a convalescent home he returned, with a few moist râles in the chest. Œdema due to nephritis resulted. He slowly recovered except for the nephritis. The pneumonia was due to *Bacillus coli communis*.

FREDERICK LANGMEAD.

Lobar hepatisation in infancy (*'Arch. de Méd. des Enf.,'* 1911, XIV, *p.* 401).—**A. D'Espine** and **Mallet** consider that apical pneumonia is often undetected in infancy. The authors narrate three cases of extensive lobar pneumonia coincident with broncho-pneumonia due to the pneumococcus, all of which died. The combination shows itself as that of a pure pneumonia and not a broncho-pneumonia, with sudden onset and continued fever. The prognosis is grave in the first two years of life. The authors consider that the gravity of the disease may be due to complications resulting from pneumococcal infection (meningitis, etc.), to a mixture of fibrinous pneumonia and broncho-pneumonia, or to renal or intestinal complications.

F. R. B. ATKINSON.

The diagnosis of enlarged mediastinal glands (*'The Canad. Pract. and Rev.,'* 1911, XXXVI, *p.* 301).—**H. C. Parsons** asks whether the signs and symptoms justify a diagnosis of this condition during life. He divides the intra-thoracic glands into five groups: the tracheo-bronchial, the bronchial, the pulmonary nodes at the hilus of the lung, the anterior mediastinal, and the posterior mediastinal. The children with enlargement of these glands are usually pale, ill-nourished and ailing, with frequent coughs, and irregular rise of temperature from time to time, and often show nothing on examination to account for the condition. In some cases the cough is brassy, like that of aneurysm, or paroxysmal like that of whooping-cough. There may be inspiratory stridor, and occasionally impairment of the percussion-note in the first and second right intercostal spaces close to the sternum, enlargement of the superficial veins, a venous hum in the first right space or behind the sternum, deficient entry of air into one lung, or lobe of a lung, increased resistance over the manubrium, or palpation of the edge of a mass in the episternal notch. These signs are suggestive, but hardly conclusive. X-ray examination promises to be the deciding factor. A band of shadow may be cast to the right of the sternum, or a rounded shadow opposite the root of the lung on one or both sides.

J. PORTER PARKINSON.

Hydatid cyst of the lung in a girl, aged 9 years (*'Gaz. hebd. des Sci. Méd. de Bordeaux,'* 1911, XXXII, *p.* 1).—**R. Cruchet** reports a case in a girl, aged 9 years, who came to the hospital in June, 1909, for cough, night-sweats, and wasting. At the base of the right lung there was loss of vocal fremitus, dulness, and muffled breath-sounds, but no râles. There was no fever. Exploratory puncture was negative. During the following winter she had a cough and occasional diarrhœa, with black bodies resembling decomposed blood appearing now and then in the stools. In June, 1910, she coughed up a considerable quantity of blood on two occasions; this was followed by whooping-cough, during which she brought up pus and blood. In September she vomited membranous *débris*. At this time the signs previously mentioned were found at the base of the left lung, limited above by a curved line whose convexity was upwards at the level of the xiphisternum. There was in addition whispering pectoriloquy. The radioscope showed a

shadow corresponding to the dull area. A morsel of the vomited membrane showed the hydatid structure. The condition gradually improved after the vomiting on September 27 of a large piece of membrane, and the signs gradually disappeared in the chest. Previous to the discovery of the vomited membrane, empyema, bronchiectasis, and cavities due to tubercle and hereditary syphilis were discussed. J. Porter Parkinson.

Pulmonary hydatids in children (*'Austral. Med. Journ.,'* 1911, xvi, *p.* 127).—**R. M. Downes** has treated at the Melbourne Children's Hospital forty cases of hydatid disease during the years 1904 to 1910, twenty-five in the liver, six in the lung, two of the abdominal wall, and one each in the cerebrum, pelvis, femur, and rib, three in both liver and lung together. Of the lung cases five were operated on, one coughed up cysts, one was diagnosed post mortem, two were diagnosed by the X rays. All were discharged relieved of the hydatid disease. F. R. B. Atkinson.

Electrargol in the broncho-pneumonia of children (*'Le Progrès Méd.,'* 1911, No. 14, *p.* v).—**H. Perrier**, in his *Thèse de Lausanne*, reports 47 cases, lobar pneumonia being carefully excluded, treated by electrargol, of which 11, or 23·4 per cent., died, comparing favourably with the usual mortality of 60 or 90 per cent. The fatal cases, moreover, all suffered from serious complications, such as abscess, purulent pleurisy, affections of the thyroid peritonitis, and congenital syphilis. Even in cases secondary to measles and whooping-cough the mortality was low. With this treatment the short duration of the disease is striking; after a period of six or seven days, or even less, the temperature falls, and definite cure results without any relapse and more like cases of lobar pneumonia. The treatment produced no untoward symptoms, and seemed to prevent the loss of body-weight so noticeable in this disease. The action of electrargol on the temperature is very different from that of antipyrine and other similar drugs; it is constant, and corresponds to the improvement in the patient's general condition; it acts as a microbicide and stimulates the resistance of the organism. M. Perrier has treated children as young as $2\frac{1}{2}$ months. He begins by a dose of 5 c.c. even in children only a few months old. As long as the fever lasts the injection is repeated daily, and at intervals of two or three days after the fall of temperature. In grave cases he uses 10 c.c.; in adults 30–40 c.c. may be used. Vincent Dickinson.

Serum treatment of pneumonia in infants and young children (*'Med. Record,'* 1911, i, *p.* 712).—**G. Mathers Sill** believes that a polyvalent serum or vaccine should be used in this disease early and in good-sized doses, 10 c.c. subcutaneously at varying intervals according to the requirements of the case. The best results are obtained from the serum of a horse immunised against the pneumococcus and other germs commonly present in these cases. F. R. B. Atkinson.